The Builder.

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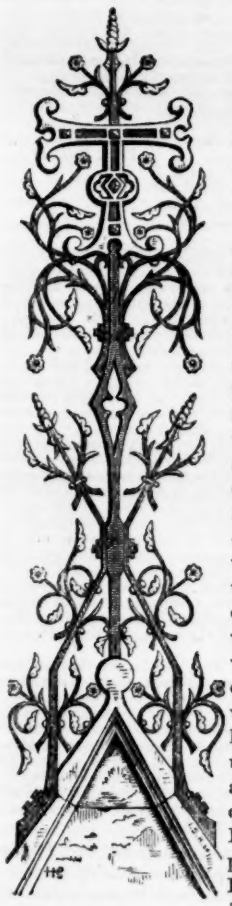

*Architecture and Engineering in India.**

HE revival of architectural taste which has sprung up in England within the last twenty years is slowly but gradually spreading to India; and within the last few years more than one handsome church, railway-station, or other public building has been erected which would do no discredit to any European capital. This improvement certainly has not come before it was wanted. Until lately we did not shine in designing public or private buildings at home: witness the heterogeneous rows of suburban villas in the neighbourhood of London, or the unmitigated monotony and ugliness of many of our modern streets. But we certainly surpassed ourselves in India, and succeeded in inventing a style of building (irreverently known as the Military Board style), which for ugliness beat everything that ever was constructed by man.

"Who does not know the sense of desolation that comes over one at first sight of some of our Indian cantonments," says Major Medley; "the straight and dusty roads, the rows of glaring white rectangular barracks, the barn-like church, differing only from a barrack in the presence of a square tower and classical (!) portico; the Roman Catholic chapel ditto, only smaller and with bright green doors all round.

Then the houses, evidently built after the model of the barracks, unless when the genius of the builder had displayed itself in a profusion of bright colours on the external walls, arranged in such startling contrast that the dâk horses were very apt to shy at passing it.

If we go inside, matters are not much better. High bare white-washed walls, a barn-like roof, with perhaps a dirty ceiling-cloth shaking in the wind; a dilapidated plaster floor, and square holes cut in the walls doing duty as doors and windows. One exception alone is there to this puritanical simplicity, in the fire-place, which is evidently an offspring of the genius of the native mason, and consists of a grotesque mass of ornaments which would perhaps be more effective if unblackened by the smoke from the ill-constructed chimney."

The general reason assigned for such a state of things is, — 1st. The requirements of the climate; 2nd. The necessity of economy. But the cogency of either argument must be altogether denied. There can be no doubt that a thoroughly airy and well ventilated building may be made just as ornamental as one which is adapted for a cold climate only; and that a small amount of money expended in judicious ornamentation will scarcely affect the total cost of the building. The real reason has been undoubtedly a want of taste and knowledge, and now that such deficiencies are beginning to disappear, it is hoped and believed that the beginning of an improved state of things has arrived. It must be allowed that the true principles of architectural construction for buildings in the East, which are to be used by men habituated to an entirely different climate, have not as yet been discovered.

"A mosque," remarks Major Medley, "has a pleasant temperature both in winter and summer, while a Gothic church in India is, as a rule, either very hot or very cold. I do not say that Gothic churches are unsuitable to India, but only that they are so as we now build them. In the same way, many of our houses with lofty rooms, numerous openings and thin walls, are far less cool and pleasant than native houses, low and badly ventilated as they are, with thick walls and few doorways. I do not say that we ought to live in native houses, but simply that we have not as yet hit upon the right way of constructing our own.

Treating of architecture as distinct from mere building, it is an art, not a science, and therefore does not fall under exact rules of instruction; one consequence of which is, that while engineering advances and improves, architecture stands still and copies. We make better roads and bridges now than in the fifteenth century, but we have hardly got beyond copying their churches; and until there is a reformation in this respect, it is hopeless to expect that we shall have an architecture adapted to the peculiar circumstances of Anglo-India."

As to the style of dwellings in the Upper Provinces of India, it is doubted whether the present style is not radically unsuitable to the climate.

"In a hot and damp country, especially if near the sea coast, numerous doors are certainly required by which the cool breezes may sweep through the house; and hence verandahs are necessary to shade the doors from the direct glare of the sun. But where, as in Upper India, it is necessary during the fierce dry heat of April, May, and June, to exclude the hot air altogether, by night as well as by day, the fewer doors there are the better; and ventilation should be secured through the roof. In the cold weather, the paucity of doors would add much to the comfort of the house; and verandahs might perhaps be altogether dispensed with. The thin walls which now get so thoroughly baked that they continue to radiate heat by night and day for months together, should be made twice their present thickness, or, better still, might be double. Upper-storied buildings are perhaps more suitable to Lower than Upper India, unless the upper rooms are used solely as dormitories; but considerations of expense will generally bar their adoption. In many parts of the country, perhaps the old Eastern style of building round an open quadrangle in the centre might be adopted with advantage. This open court, paved with marble or stone, filled with fragrant shrubs, and with a fountain and tank in the centre, is characteristic of most of the dwellings of the wealthy throughout Syria and other Eastern countries, and is, indeed, common enough in native houses in India. Perhaps some one will work the idea into a tangible shape."

He protests against the indiscriminate use of plaster so generally applied to buildings of all kinds in India. In most cases it is simply used to conceal bad masonry, and every plastered building looks shabby in a few months after being constructed. It is expensive and adds no strength to the work. Brick masonry, if well executed, as he observes, has a beauty of its own, and with well-made bricks, well bonded, and with fine joints, there can be no meaning whatever in hiding the material. Some excellent specimens of brick masonry have been lately erected * in Upper India, but improvement is required in the manufacture of bricks before this kind of work can be executed to the best advantage.

Will somebody, he asks, invent a new material for roofs in India?

"Slates we have not, except in one or two out-of-the-way localities. Galvanized iron we cannot get. Tiles get broken and look ugly, and are leaky. The ordinary flat terrace-roof leaks also, and is very heavy. A trussed roof with a very slight pitch (say 10 degrees), and covered with flat bricks and lime terrace, is about the best we know, but is very far from being what it should be."

But floors are worse. A lime floor looks very well when just finished, and for a private house answers its purpose fairly; but for a building like a barrack it is soon cut up, is unhealthy (the dusty particles flying about engender ophthalmia), and it is impossible to repair it satisfactorily. A plank floor is expensive, perishable, and warps from the extreme changes of the climate. The best floors hitherto made are those of flat brick or brick-on-edge. But why should not this method be improved upon in public and private buildings? Excellent coloured and glazed tiles are made in the Punjab and other parts of India. The glaze is objectionable as making the floor slippery and apt to chip or wear off, but why not use the unglazed encaustic tile now employed so largely in England by Minton and other manufacturers? The requisite materials exist, it appears, in plenty throughout India, and nothing is wanted but the requisite skill and capital. One other material may be named for floors, viz.,—plaster of Paris, which abounds in some parts of India, as for instance, the Dehra Doon. It is well adapted for floors, as well as cornices, and other interior parts of buildings, and is capable of being made into highly ornamental forms.

In India the architect and engineer are generally one, and he is also the constructor as well as designer. The requirements of the climate necessitate modes of construction differing from those in England, but until lately our Indian engineering architects have not managed to combine coolness and ventilation with much architectural beauty. A reform in this respect is, however, in progress. Major Medley says,—

"We are at least erecting handsomer buildings, and attention is being directed towards cooling them effectually. The difficulties are great, but with all drawbacks, many fine public buildings have been completed, many more are being constructed and projected, and churches, railway stations, and Government offices are rising fast, which would do no discredit to any capital."

Some specialities of construction which are common to most Indian buildings attract the attention of the new comer. Except in the Presidency towns, they have no upper story, partly from considerations of expense, and partly because the upper rooms get very hot during the dry months. The roofs are either thatched or tiled, or else are flat and covered with brick and lime plaster. The thick beams supporting the roof are, as a rule, left exposed below. The room walls are very rarely papered, being usually plastered and whitewashed. Wooden floors would be too perishable and dear, so floors of flat tiles or of lime plaster are substituted. Doors are numerous, and are invariably double, opening in the middle. Verandahs all round a house are considered indispensable.

In many of the most important and interesting branches of engineering, little has been done as yet in India: in drainage, water supply, and gas-lighting, they are now only making a commencement even in the Presidency towns. A fine scheme is, however, in progress for the drainage of Calcutta; and a similar project will shortly be submitted for Madras, while the drainage and conservancy of native towns and European cantonments are engaging much attention.

In the improvement of the great rivers for inland navigation, little or nothing has been done, but many navigable canals are at work in Madras and Bengal, and others are in progress. In Bengal, inundations from the sea and rivers have also given practice in the important subject of embankments; and the Hidgelee Sea Dyke, when completed, will, it is said, be a noble work.

Of military engineering not much is said. Like the Romans of old we encamp our Indian troops in the open instead of shutting them up in forts. The arsenals are for the most part inside old native forts, slightly improved, and except Fort William and the outposts on the north-west frontier, there is scarcely a single fort of modern construction in the country.

In India the Government is the constructor and maintainer of nearly every public work throughout the country. Not merely works which specially appertain to an immense military establishment, but every road, bridge, church, court-house, jail, &c., has to be built from imperial funds, and through Government officers. Nor can even the railways be excepted, for though the capital employed is not its own, yet the controlling power possessed by Government is so great,* that not the smallest work can be undertaken, nor the salary of the least official paid, without its written authority.

Every effort is being made to introduce the contract system, and it is generally in vogue in

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* "Professional Papers on Indian Engineering." Vol. I., 1863-64. Edited by Major J. G. MEDLEY, R.E., A.I.C.E., Principal, Thomason College, Roorkee. Printed and published at the Thomason College Press, Roorkee. Calcutta: Thacker, Spink, & Co. 1864.

* The new Government School-house at Umritsur, built by the Municipal Engineer, Mr. W. Gordon, and the new Lahore Railway Station, are instanced as excellent specimens.

* This arises from the guarantee system.

the Presidency towns, and on most of the great railway works; but over the whole country the vast mass of the Government work is done by daily paid labour, and the extra work thereby thrown upon an engineer may be easily conceived.

In many parts of the country there is no organization of labour whatever, and when works have to be executed, the engineer has to collect and train his workmen, to make arrangements for carriage, to make his own bricks, burn his own lime, cut his own timber, and in a word superintend a hundred petty details, which in a civilized country are undertaken by a hundred different men, each skilled in his own peculiar business.

Of the workmen themselves, much good is reported. If well managed, they are as a rule both intelligent and teachable. Excellent masons, carpenters, and smiths abound in the country. The machinery in the various railway workshops is managed by natives under European superintendence, though there are no native engine-drivers as yet.

The most striking thing to the engineer fresh from England, is the total absence of the ordinary mechanical appliances for executing work. Vast earthworks are still made by the help of the *phowrah*, or native spade, and baskets carried on the heads of women and children. Wheelbarrows are scarcely ever seen; horse carts still more rarely. For getting water out of foundations, &c., pumps are coming into use, but in general the primitive native modes of baling, or the *Churus* (leather bag), or Persian wheel worked by bullocks, are still employed. Bricks and tiles are almost invariably hand-made, and the pug-mill is unknown: the saw-pit is never used. The principal reason for this is the comparative cheapness of labour, but if the rate of labour increases for a few years longer, as it has done for some time past, the introduction of more elaborate appliances will become essential. At present, except the railway workshops, and those established at Roorkee, there is no steam machinery in the country, unless at the Presidency towns. Machines driven by wind power are also unknown, it is difficult to say why. Of the enormous water power available on the numerous canals and rivers, very little is utilized.

In Central India and the hilly districts all over the Indian continent, many varieties of excellent building stone exist, and are abundantly used. In the great plains of Bengal, Hindostan, and the Punjab, however, brick is the only available material. The English sized bricks, or those of a still larger size, are now coming into general use. The native bricks are very small, excellently burnt, laid with little attention to bond, and with a profuse expenditure of mortar. Bricks are burnt with wood fuel, in kilns of several kinds, or in stacks like English clamps, with dried cow-dung instead of coal.

Excellent lime is everywhere abundant, produced either from limestone *in situ*, or the boulders found in hill torrents, or the kunkur found in the plains. It is mixed with various substances for mortars, of which pit-sand and soorkhee (pounded brick) are the chief ingredients. For very strong or fine mortars, coarse sugar and egg-shells are sometimes added.

A great variety of fine timber is found in India, generally brought from the forests in the hills, among which may be noticed *Saul*, a dark, heavy, straight and strong wood, and *Deodar*, nearly the same as the cedar of Lebanon; the former used in the North-West Provinces, the latter in the Punjab for every kind of building purpose. Both of these are found in the hills alone, at an elevation of from 2,000 to 5,000 ft.: the trees are cut down and thrown into the rivers, and when these rise the logs are floated down to the plains. In West and South India *teak* is in general use. It abounds in the forests of Burmah, being one of the most valuable productions of that province. *Toon*, an inferior sort of mahogany, is extensively used for furniture; *Sissoo* or *Sheeshum*, and some of the varieties of acacia, are hard, heavy, crooked woods, used for strength and toughness.

Iron ores of fine quality are abundant in many parts of India, but from the want of fuel and carriage are little worked, and English iron is generally used. Government have made, and are now making, several praiseworthy attempts to develope the manufacture of iron.

The greatest works as yet executed in India, belong, as in England, to the railways. Indeed, there are none in the world more interesting or important than the Bhore Ghât incline, of which we have more than once given particulars in the *Builder*, or than the Soane and the Jumna bridges, and other works little inferior to them which might be enumerated. The East Indian Railway, 1,000 miles long from Calcutta to Delhi, with the branch to Jubbulpore now under construction, is probably the longest line in the world owned by a single company, as it is certainly one of the greatest triumphs of engineering. The Great Indian Peninsular, and other lines, though inferior in length, are, some of them, at least, of equal engineering interest.

With them may be classed the great roads, though the system, like that of the railways, is still far from complete.

"The Grand Trunk Road from Calcutta to Lahore, 1,300 miles in length, comprises every variety of construction, from the heavy gradients through the Rajmahal hills, to the massive and level embankments between the Jumna and the Sutlej. The Lahore and Peshawur road, a continuation of the Trunk line, 270 miles long, and now rapidly approaching completion, may challenge comparison with any in the world; while, in the formidable extent of drainage crossed by it, it probably stands alone. Of others, the Hindustan and Thibet road when finished, may take its place by the side of any of the famous Alpine roads; while the great Deccan road, the Assam road, and many others still in hand are works of considerable magnitude."

It is, however, in the great irrigation works that have been, or are being, constructed in India, that the peculiarities of Indian engineering are more especially to be sought; for, except in Italy, those works have no counterpart in Europe. The Ganges canal, 900 miles long with its branches, and pouring its waters over a million of acres through 3,000 miles of distributing channels; the East and West Jumna canals, 200 and 500 miles long, respectively; the Baree Doab canal, also 200 miles in length, are works of which any country may be proud, and in the principles and construction of which engineers have to learn much which they cannot be taught in England. An entirely separate class of works are the great weirs and tanks of Madras, whereof the works on the Godavery are the finest examples, and which are also purely Indian specialities.

Of the Solani aqueduct, by which the Ganges canal is carried across the valley of the Solani river, we have already given an account in the *Builder*; but the subject is one of so much interest to the profession, from the magnitude and peculiarity of the work, that we cannot refrain from here inserting the brief description of it given by the editor of the work under notice, with reference to a lithographed photograph of it which appears as a frontispiece.

"The Solani Aqueduct, by which the Ganges Canal is carried across the valley of the Solani river, consists of an earthen embankment or platform, raised to an average height of 16½ ft. above the country, having a base of 350 ft. in width, and a breadth at top of 290 ft. On this platform the banks of the canal are formed, 30 ft. in width at top, and 12 ft. in depth. These banks are protected from the action of the water by lines of masonry retaining walls formed in steps extending along their entire length, or for nearly 2¼ miles north of the Solani.

The river itself is crossed by a masonry aqueduct, which is not merely the largest work of the kind in India, but one of the most remarkable for its dimensions in the world. Its total length is 920 ft.; its clear waterway 750 ft., in fifteen arches of 50 ft. span, each. The breadth of each arch is 192 ft.; its thickness is 5 ft.; its form is that of a segment of a circle, with a rise of 8 ft. The piers rest upon blocks of masonry, sunk 20 ft. deep in the bed of the river, being cubes of 20 ft. side, pierced with four wells each, and undersunk in the usual manner. These foundations, throughout the whole structure, are secured by every device that knowledge or experience could suggest; and the quantity of masonry sunk beneath the surface is scarcely less than visible above it. The piers are 10 ft. thick at the spring of the arches and 12½ ft. in height. The total height of the structure above the valley of the river is 38 ft. It is not, therefore, an imposing work when viewed from below, in consequence of this deficiency of elevation; but when viewed from above, and when its immense breadth is observed, with its line of masonry channel, nearly three miles in length, the effect is most striking.

The water-way of the canal is formed in two separate channels, each 85 ft. in width. The side-walls are 8 ft. thick and 12 ft. deep, the depth of water being 10 ft. A continuation of the earthen aqueduct, about three-quarters of a mile in length, connects the masonry work with the high bank at Roorkee, and brings the canal to the termination of the difficult portion of its course.

This great work was designed by Sir Proby T. Cautley, and chiefly executed by Capt. (now Lieut.-Col.) A. G. Goodwyn, R.E. It occupied seven years in construction, and cost Rs. 32,87,000."

Among the numerous illustrations in this interesting volume there is a photograph of Trinity Church, Sealkote, designed and built by Lieut.-Col. J. H. Maxwell, R.E., at a cost, to the Indian Government, of 41,000 Rs., besides subscriptions to an unknown amount. The spire cost a further sum of 3,869 Rs., and was completed in 1861.

Engravings are given of the design for Cawnpore Memorial Church. This edifice was in progress when the volume under notice was published. Competitive designs were called for in 1861, the cost of the building being limited to 1,20,000 rupees. The design of Mr. Walter Granville, C.E., consulting architect to the Government of India, was selected. This design is founded on the round-arched Lombard and Romanesque styles of architecture, with introductions from the later Italian Pointed style, in accordance with a suggestion of the Government of the North-Western Provinces of India.

The architect, in his descriptive remarks, says:—

"It is proposed to build the walls of the church of red pressed bricks, faced in part *outside* with Chunar stone in dark grey bands: *inside*, the walls are to be faced solely with stone. The roof is groined in stone in the simplest manner. The cornices, arches, and columns are to be also of Chunar stone. The flooring is also of stone, with a pattern of grey Chinese marble. It is not intended to have any plastering either externally or internally. It is urged that this church especially should be a memorial church, *ære perennius*, and as such typical of our enduring supremacy.

The dimensions of the church are as follows:—

	Feet.	Inches.
Extreme length inside	141	0
Extreme width inside	50	6
Height of church	46	0
Width of nave.....	25	6
Depth of chancel	42	0

The church is capable of affording sittings for 500 persons on the ground floor. In the gallery at the west end, over the vestibule, 100 more persons can be seated. The organ is placed in the gallery of the south transept, and there is a corresponding gallery in the north transept: these will seat, if required, 100 more persons: thus giving accommodation in all for 700 persons.

The method by which the church is lighted and ventilated and secured against the intensity of glare, forms one of the chief objects of the design. In this bright climate light should be admitted with caution, and there is this advantage that it produces a shadowy effect or "dim religious light," which is highly favourable to architectural grandeur. The principal light is obtained from a considerable elevation immediately above the lower passages or aisles. It is admitted, *firstly*, through a series of small pointed arches pierced in the outer walls of an upper arcade built over the passages below; *secondly*, through a series of similar arches left in the inner walls of the church. This double arrangement for admitting light will tone down the rays of the sun and obviate any inconvenient glare, while it effectually prevents the rays from falling directly on the people occupying the seats on the floor of the church. By leaving all these openings free from glass, a free current of air is afforded for the ventilation of the church. . . . . .

So far the design differs from any known church; but whilst I have departed from the usual plan of northern churches in this particular, on account of the climate, I have adhered to the orthodox plan of a church appointed for celebrating the rites and ceremonies of the United Church of England and Ireland. I have moreover endeavoured to give to the exterior and interior at least an Oriental stamp, by the introduction of coloured bands, which, so far as I remember, had their origin in the East amongst the Tartar tribes, and were introduced by them into every country they occupied."

The architect's estimate amounted to 1,17,700 Rs., but subsequent experience showed that the estimate was insufficient, and it was raised to 1,51,131 Rs., which sum was sanctioned by Government. An improvement has at any rate been initiated in India, and not before it was called for.

THE LATE SIR JOSEPH PAXTON.*

ACCORDING to Montesquieu, the success of most things depends upon the knowing how much time will be wanted in order to succeed. ("*Le succès de la plupart des choses dépend de savoir combien il faut de temps pour réussir.*"—Pensées Diverses.) In such a case as that of the building for the Exhibition of 1851, as we have seen, the time being fixed, the success is dependent upon the selection of means and appliances with reference to the time, and upon a certain tact in the rejection, consistently with safety to life, of numerous details. It is dependent also upon tact to select, if not upon the good fortune of having, agents to whom matters of supervision, and if need be contrivance, can be delegated. Ability of the particular sort finds its best illustration in the career of Napoleon. Ordinarily it neither renders the less necessary, but rather the reverse, genius, so called,—which is the accumulation of the results of thought and study, just as capital is the accumulation of the earnings from labour,—nor dispenses with the necessity of fresh and increasing exertion of the personal kind. It is a peculiar gift,—that which secures the co-operation and aid of numerous hands and minds. Probably there is involved with it the readiness to accord credit to others, when due. Both the gift and the disposition were features of Sir Joseph Paxton's character; and probably were he now living, it would be easy, with his aid, to determine the exact share of merit due to him for what would have been the architect's work in the design of the building of 1851, as well as in that of the Crystal Palace. That he himself thought he had, for one of these buildings at least, accomplished the greater part of what is ordinarily architect's duty, is possible. Architects

* See p. 421, *ante*.

will know that he did not personally accomplish so much in the former case; but his name is not therefore unworthy of honourable record in association with the first International Exhibition.

It is clear to us, and indeed we have already shown, that the building of 1851 was accomplished only by a course of proceeding that could not be recommended for imitation, and by omission of what would be in every other case an architect's duty. At least, the work was accomplished with a deficiency of control over expenditure, such as it is hardly possible to conceive could be allowed to occur again, or now that Government is claiming to set example of having precise estimates before building. It was argued publicly, at the time, by the present Sir Charles Fox, that the building could not have been completed had the work been supervised in the ordinary way by an architect,—thus showing that in the contractor's opinion, there was no one performing what would have been the ordinary duties of architect. And that there had been no such authority, was afterwards testified to by the fact that, although there had been a contract, a large sum of money had to be allowed to the contractors, not as justly claimable for extras, but as *bonus*. Paxton saw that there was a difficulty; but neither did he, not being an architect, succeed, as stated, where the whole profession had failed; nor did he then acquit himself of the duties of architect. We have seen that the idea of an iron and glass building had occurred to others; he renewed the suggestion at a happy moment for his fame; and had the mechanical appliances at hand, by which alone success was possible. A man better acquainted with the nature of the steps that are usually preparatory to commencement of such a work, would have been likely to hesitate, and might in the end have not done so well. But no one would contend that the course that was taken as to the building of 1851 should be repeated.

Paxton himself gave a history of his design at the Derby Mechanics' Institution on the 8th of October, 1850. He said that his first idea of sending in a design, occurred to him while conversing with a friend on the subject of the construction of the new House of Commons. Paxton said he thought a blunder would be made, and that he had a notion in his head. He went to the Board of Trade to ascertain from the executive committee of the Exhibition, whether it was too late to send a design,—whether they were so far committed to the design of the building committee as to be precluded from receiving another. The answer was, "Certainly not: the specifications will be out in a fortnight; but there is no reason why a clause should not be introduced allowing of the reception of another design." Without taking into account the behaviour to the profession, it must be observed that had legal proceedings been adopted by each of the builders who had been made to incur expenses on a basis that was removed, the executive would have been rightly treated. Mr. Paxton replied,—"Well, if you will introduce such a clause, I will go home, and in nine days hence, I will bring you my plans all complete." No doubt, he is reported to have said, the executive thought him a conceited fellow, and that what he had told them was nearer akin to romance than to common sense. The interview with the executive took place on Friday, the 11th of June. Paxton did not go straight home, but first to the Britannia Bridge to see the third tube placed. On his return to Derby he had to attend a board-meeting: but his mind was occupied with his design; and then it was that he made the sketch on blotting-paper. The report of what he said, at Derby, continues,—"He was sorry he had not the original with him; but the fact was Mrs. Paxton had taken possession of it, and if they were at all anxious to see it, the only possible way of gratifying their desire was by sending for her to the meeting." He sat up all the night of the board-meeting; and, *by the aid of his friend Mr. Barlow*, he was enabled to complete the whole of the plans by the Saturday in the following week, on which day he left Rowsley for London. On arriving at Derby, he met Mr. Robert Stephenson, a member of the building-committee, who was also going to London. Mr. Stephenson examined the drawings, and at length said the design was just the thing, and that he only wished it had been submitted in time. Mr. Stephenson, however, laid the drawings before the committee. The idea was at first "pooh-poohed;" but the committee "did in the end reject the abortion of a child of their own, and unanimously recommend his bantling," the design having been in the interim published.

Mr. Paxton was soon afterwards consulted by Yorkshire manufacturers and others with reference to the application of his system to covering large areas; and Mr. Batty proposed to him to make a design for the Hippodrome then intended to be erected, but which eventually took a different form.

From the date, at least, of the acceptance of his design, the credit due for the Exhibition building must be considered as largely shared in by others. In the preparation of the working-drawings, Sir Charles (then Mr.) Fox, who was one of the contractors, Mr. C. H. Wild, and Mr. M. Digby Wyatt were concerned; and Mr. Owen Jones produced most of the decorative details that Barry had not perfected, as well as the polychromy. The most important matter of detail structurally, due to Paxton's appearance on the scene, was the roof-construction. We have already adverted to the ridge-and-furrow arrangement, and to the modes of making the sash-bars (of which there were to be 205 miles) and of fixing the glass, but some few words remain to be said of the guttering. Paxton had a large amount of knowledge and acquired experience as to modes of treating these features of a building. The analogy between the work of nature, and the work of architecture, already shown by a comparison of the supporting members of the leaf with those of the roof of this building, and ever to be noted of the art decorative as of the art structural, was never better shown than by a comparison of the arrangement on plan, of the gutters, with the disposition of the major and minor, and confluent channels, of the surface of the leaf. The smaller channels running lengthwise with the building, were the "Paxton-gutters." The bays, or spaces between the columns, being 24 ft., the water had to run 12 ft. each way to the transverse-gutters. The "Paxton-gutter" comprised at once a water-channel, and support to the spans of the ridge-and-furrow roofing. It was formed out of a solid piece of timber, by a machine similar in principle to that for the sash-bars. It was dished out at the top for the water-flow, and grooved at the two sides in channels for the condensed moisture from the glass. The gutter, or bearer, was trussed by tension-rods, a camber being given by screws at the ends, which could be adjusted to great nicety.

There were several claimants to priority of this invention, as well as of the ridge-and-furrow system. Information of some importance was communicated to the *Builder* in 1851, and will be found in our number for March 1st of that year.* The author of the communication plainly said that Mr. Paxton was not the inventor of the methods of roofing and construction. He stated that Mr. W. Strutt, of Derby, in conjunction with Mr. C. Sylvester, engineer, had, forty years previously, executed a ridge-and-furrow roof with the triple gutter,—the gutter however being of iron,—and that Mr. Paxton had admitted having seen this; also that Mr. John Sylvester had designed and executed seven years before 1851, a vinery wherein the same system was adopted, with the gutter in wood, formed out of the solid; and further, that going four or five miles along the Edgeware-road, there was to be seen a ridge-and-furrow roof over a greenhouse that had been erected twenty-five or thirty years previously. Afterwards, another statement appeared in the *Builder*, but similarly pointing to use of the system before Paxton's time.

The contrivance for keeping the building cool, other than the ventilation by louvres, consisted of an external covering of canvas. This method has been proved by experience at the Palais de l'Industrie, as well as that in 1851, to be open to objections, some of which indeed are obvious.

One of the most important of Paxton's unquestionable suggestions in matters of detail, was that derived from his trellised wooden pathways in greenhouses, of placing the boards of the flooring half an inch apart, so that the dust might fall through in sweeping. There is no doubt that this arrangement was greatly conducive, not only to the comfort of visitors, but to the continued effect, and freedom from injury, of articles exhibited. Whilst the ventilation was being considered, a house at Chatsworth was fitted experimentally with a contrivance similar to the Indian *punkah*; and the result led to the contemplated adoption of a like system in the Exhibition building. When describing his design at the Society of Arts, Mr. Paxton showed that he had in view a permanent winter-garden, with rides and carriage-drives in it.

The tender of Messrs. Fox & Henderson was accepted verbally on the 26th of July, 1850; and possession of the site was given on the 30th; but the first column was not raised till the 26th of September.

During the progress of the building, the value of mechanical appliances,—whether invented, suggested, or generally contemplated, by Paxton,—was apparent; in fact, in no case of a building has the importance of machinery to the realization of the object, (and the importance, too, of the same machinery, in the view of the employment and interests of workpeople,) been better shown. Our profession, however, was now at a discount. The members of the Society of Arts were told by an eminent professor, that architects made no calculations. Mr. Fergusson argued in this journal, that Paxton's success was due to the fact that he was not an architect, and had been practically carrying out an aggregation of his experience under the guidance of common sense. It would be easy to contend that *routine*, which architects were accused of, happened just then to have served Paxton. But Mr. Fergusson's assertion that we had got a building of which everybody approved, was shown to be erroneous by the fact of the discussion at the Institution of Civil Engineers, as well as by the proceedings at the Society of Arts; and the alterations that had to be made in Paxton's work, would simply have blasted the reputation of any member of our profession. The journals, however, were loud in praise of the great architect, as he was considered to be; and even men like Lord Brougham joined in the exaggerated laudation. One of the journals, after speaking of "the appropriateness, the elegance, the vastness, and the beauty of the design," and "its simple but most admirable novelty," acknowledged "Mr. Paxton's high claims to the grateful appreciation of his contemporaries, and to that enduring place in the national annals which is the best reward of all true greatness in any and every department of public usefulness." Generally, writers in the papers mistook mere size for beauty, and the charm of perspective for something that had come of art-design.

The jury of Class VII., "Civil Engineering, Architecture, and Building Contrivances," in their report, recommended the award of the council-medal "to Mr. Joseph Paxton, who originated the design" of the building, "and to Messrs. Fox, Henderson, & Co., who most ably carried it into execution." Messrs. Paxton and Fox were knighted, as also was Mr. Cubitt, to whom the details of construction generally had been submitted. "As regards Mr. Paxton's claim," the jury said,—erroneously though, if the facts be strictly looked at,—that "amidst the competition of the whole of Europe, he proposed that mode and form of construction of building which appeared on first sight, and which has since proved to be, the best adapted in every respect for the purpose for which it was intended." They discovered in the design the "peculiar merit of fitness" for the object, in its having no startling novelty. They recognised that designs nearly resembling it as to form of outline, and materials, had been sent in the competition; but said that in the combination and application, and in various details, it was "entirely distinct in character from all that had been proposed, and appeared at once to have the one single merit of being exactly that which was required for the purposes in view." Our readers are in a position to judge to what extent these assertions are to be assented to. The building, far from being completed by the 1st of January, 1851, was not finished until long after the arrangement of the goods had commenced. The leakage was considerable, even after the building had been opened. Yet its retention as a permanent structure had been contemplated by Mr. Paxton.

Upon the close of the Exhibition, an attempt was accordingly made to have the building retained in its site in Hyde Park. This, however, fell through. The question had scarcely been decided, when there appeared the scheme of the Crystal Palace Company, for the building at Sydenham. The original prospectus, dated 17th May, 1852, contains the name of Sir Joseph Paxton, as "Director of Winter Garden, Park, and Conservatory," that of Mr. M. Digby Wyatt as "Director of Works," and that of Mr. Owen Jones as "Director of Decorations,"—Messrs. Fox, Henderson, & Co. being "Contractors for the re-erection of the Building." It seems, however, that Paxton had the direction of every-

* Vol. ix., p. 134.

thing connected with the building as well as the grounds, the services of Messrs. Wyatt and Jones being generally confined to the collection of the works of art, and their arrangement in the fine-arts courts designed by them,—Mr. Jones, however, having the management of the decorative painting of the building. The first column was raised in August, 1852. The report presented, and the chairman's speech, on the 17th March, 1853, repeatedly mention Sir Joseph Paxton, in connexion with plans and designs; and a printed paper issued in the following August, names Messrs. Jones and Wyatt as "Directors of Decorations," and Mr. Charles Heard Wild as "Engineer." Sir Joseph had now associated with him Mr. Stokes, to whom are due the architectural features of the external terraces and fountains, and the Sheffield Court. We believe also that Mr. Stokes assisted in the preparation of the original drawings of the building.

It is plain however that Paxton occupied a more important professional architectural position than he had filled in relation to the building of 1851. But those who would claim for him the entire status, at this time, of an architect, must be prepared to defend much of the work that there is reason to consider defective in the Sydenham building. The bulk of this particular construction is that of the building of 1851, and was the result of the employment of its columns and girders: but the defects so comprised must be considered as so many instances of original failure; since, as we have seen, even the building as designed for Hyde Park was contemplated as to be permanent. We have given attention to certain views on the particular system of column-and-girder construction, which are assumed to have gained importance from the destruction of one of the wings at Sydenham; and we may here add that many parts of the building are in gradual process of reconstruction, as by the substitution of iron supports for wood, or in order that the whole may have better chance of permanence. The brickwork supporting the iron columns, on the east side, where the slope commences, if we remember rightly, had no great strength; but what is most important for the question of the ability of whomsoever is to be regarded as architect, is the fact that the two water-towers, after considerable progress had been made with them, had to be taken down, that they might be erected on wider areas of base. As regards effect of outline in themselves, and the grouping with the main building, they were not very successful at first; and they are less so as they are. In an architect's work, there is no substitute for thought; and the danger from dispensing with it is so serious, that whoever even has had the luck once to achieve success that way, should be duly mentioned when the result is the reverse, or that which generally is probable. It is not a settled question whether the architect shares responsibility for the failure of a peculiar contrivance of scaffold, brought into use by contractors, under novel conditions of the execution of a design: otherwise, in the zeal after crediting Sir Joseph Paxton with the performance of the duties of an architect, he might have ascribed to him some of the discredit of the accident during the construction of the roof of the central transept, when there was sacrifice of life, and when no sufficient cause of the accident could be stated by the contractors. With the particular contrivance then, he had, however, as we believe, no connexion.

We have already alluded to claim made on Paxton's behalf, to the credit of the particular construction of the arched roof. If this be allowed, there should be attached to it that of the arrangement of the projecting pairs of columns, which support the principals, and add much to the internal effect.

It remains only to mention of the Crystal Palace, that the ceremonial of the inauguration took place on the 10th of June, 1854; and that the general conception of the scheme, the direction by Sir Joseph Paxton as to the building and its contents; and his designs for, and superintendence of, the unprecedented and most elaborate hydraulic works; as also his artistic skill in the arrangement of the grounds, are now monuments of him that require no addition here of panegyric.

Contemporaneously with the achievement of the Crystal Palace, Sir Joseph Paxton became absorbed in a successful career, both of general public usefulness, and, now unquestionably, of the practice of an architect. He was elected a member of Parliament, for Coventry, in December, 1854; and in this capacity, his experience in connexion with works of construction, has been of great advantage. During the Crimean war, he secured the establishment of the Army Works Corps, of "navvies;" and he also designed huts, of somewhat novel form, to which reference will be again made. He was a most useful man in committees; and it may be considered owing to his exertions that the Thames Embankment is now in progress, and that the Low-level Sewer is not being constructed along the Strand; which latter route, the engineer had been compelled to take into consideration, seeing the apparently interminable delay as to the originally designed route by the river-side. About the time of his active connexion with the Crystal Palace, Sir Joseph Paxton projected and designed a very important glass-roofed London thoroughfare, which is to be found illustrated in a Parliamentary paper on Metropolitan Communications. The first suggestion of a covered way of the kind, was however made by Mr. Gye, even before 1851. Somewhat later there was a design by Paxton, for a permanent exhibition building, of iron-and-glass construction, for a spot in the environs of Paris. It was first intended to be erected on the elevated ground near St. Cloud. The principal front was to have three circular projections, or attached rotundas, surmounted by domes. Mr. Owen Jones had made a design previously.

But of actual works to which Paxton's name must be attached as architect, there were several. Indeed, they might be said to have commenced before the period of his connexion with the building of 1851. The village of Edensor, near Chatsworth, was rebuilt from his designs, and is considered a great improvement in point of taste upon what had been done before. The farm-buildings at Chatsworth also were his. After 1851, he designed and carried into execution the house at Mentmore, in Buckinghamshire, for Baron Mayer A. de Rothschild, M.P.; illustrations of which have been given by us,—also the Dairy and Cottage, and the labourers' cottages at the same place. He was the architect of the mansion at Ferrières, in France (thirty miles from Paris, on the Strasburg line), which was erected, by Mr. Myers, for Baron James de Rothschild, and of the lodge and entrance. He also made extensive alterations and additions to Lismore Castle, in Ireland, for the Duke of Devonshire, a building which we have illustrated; and he had laid out the grounds of Burton Closes, near Bakewell, the seat of Mr. John Allcard, the house being designed in some measure under his directions.

Besides these works, he had the planning and superintendence of some important public parks and gardens. A park at Liverpool was, we believe, completed some five or six years before 1851; and about the latter period he had in progress the park at Birkenhead. He laid out parks at Hull, Glasgow, and Dundee,—a pavilion at the latter place being designed by his son-in-law,—and the Coventry Cemetery—the chapels and lodges of which also were designed by Mr. Stokes. A design bearing his name, for the laying out of Shepperton Park, near Hampton, in building-plots, is now to be seen at the railway-stations. His last work was a design, just completed, for a park at Dunfermline, in Scotland.

In 1862, Sir Joseph Paxton exhibited a form of hothouse, of very ingenious but simple and economic construction. It was suggested by the Crimean huts, which consisted of two simple slopes, from eaves at the ground, to a ridge, and spanning a space composed of two flat slopes which were cut in the ground. For the hothouse, nothing additional is required, unless dwarf-piers in the ground, some distance apart, on which to lay the eaves-guttering, which rests immediately on saddles. The sashes are hinged together at the ridge; and there are no rafters: thus the whole framing and glass can be easily moved; and it can be modified in arrangement in various ways. A lean-to, of course, can be fixed on the same principle. The span can be lessened or increased; or an addition of a fresh length of framing can be quickly made. Air is given by means of narrow sashes, hinged to spaces extending from eaves to ridge. These conservatories appear to be getting into extensive use.

Sir Joseph Paxton was a Fellow of the Horticultural Society, having been elected in 1826, a Fellow of the Linnæan Society, 1833, and a Member of the Society of Arts, 1850. He was created a Knight of St. Wladimir by the Emperor of Russia, in 1844; and he became a Captain of the 11th Derbyshire Rifle Volunteers in 1860. He was a Magistrate of the county of Derby, a Director of the Midland Railway, and connected with many other undertakings. His funeral, at Edensor, on Thursday the 15th, was attended by the Duke of Devonshire, the Lords Richard, George, and Frederick Cavendish, Mr. Jackson, M.P., and Messrs. Brassey, Wythes, Owen Jones, Mark Lemon, Evans, Scott Russell, Grove, and Bowley.

Though we have thought fit to endeavour to disabuse the public of the exaggerated notion of his greatness, and of his claims to rank as inventor of a form of architecture which he had rather the good fortune to apply to a single new purpose, we regard Sir Joseph Paxton as one for whose real abilities and services, and even works, the appreciation of architects is rightly due. His personal qualities had so much relation with what he was able to accomplish, that we should add that to his discrimination of character, his ability to retain friends and useful people about him, his sharpness of understanding means, even structural, conducive to ends, his industry, and that probity which procured him the friendship of the late Duke of Devonshire, in addition to his unquestionable acquirements of a certain kind, his success may be attributed.

PORTRAIT MINIATURES IN SOUTH KENSINGTON MUSEUM.*

NEARLY "blind yet bold," we have, with a dogged determination of purpose — fatigued rather than satisfied—made ourselves critically "up" to the test of examination in the special exhibition of portrait-miniatures, borrowed for public instruction by the "Science and Art Department of the Committee of Council on Education." The importance of the collection is very great, viewed in any of three lights in which it may be advantageously studied,—with a view to history, with a view to biography, or with a view to art. Of Holbeins proper, or "ascribed to," or believed in by their owners, we have *twenty* examples. We shall give them numerically:—

648. Mr. Hollingworth Magniac's Katherine of Arragon, first wife of Henry VIII., on vellum. From Strawberry Hill, Walpole calls it (Works ii., 477) "an admirable original by Holbein," and so Mr. Redgrave might have told us.

652. Henry VIII., from Strawberry Hill, now Mr. Hollingworth Magniac's.

673. Sir Stephen Poyntz, of Iron Acton, in profile, lent by Mr. R. S. Holford, M.P.

1,011. The Countess of Kildare. Lent by Lord Boston: very curious.

1,039. The Earl of Kildare: ditto.

1,391. Queen Jane Seymour, Queen of Henry VIII., and mother of Edward VI. (very fine), lent by the Rev. Dr. Wellesley, of Oxford, whose knowledge and taste in Mediæval art is indisputable. It is in crayons, tinted, and as fine as the best of the Windsor (badly engraved) Holbeins of the same character.

1554. Thomas Howard, third Duke of Norfolk, father of the poet Earl of Surrey; lent by Mr. Philip Henry Howard. This we remember to have seen before, and our doubts that it is by Holbein are confirmed by a further experience of six years.

1590. Katherine of Arragon, Queen of Henry VIII., on vellum. Lent by the Duke of Buccleuch.

1603. Thomas Lord Seymour of Sudeley (on vellum), the Lord High Admiral of England, who married the widow of King Henry VIII. Lent by the Duke of Buccleuch.

1645. Queen Jane Seymour. Lent by Mr. Sackville Bale, whose well-chosen collection, purchased by himself,—not inherited,—merits to be carefully studied. End wall, division four, contains fourteen most valuable miniatures, the property of this gentleman.

1651. Queen Mary, daughter of Henry VIII., from the collection of the poet Rogers. Lent by Mr. Bale.

1810. Queen Anne of Cleves, fourth wife of Henry VIII., signed H. H. Oil on panel. Lent by that thoroughly well-informed Scottish antiquary, Mr. David Laing. This picture made us sigh to *renew* our acquaintance with the Meyrick (Goodrich Court) miniature of Anne of Cleves, the finest miniature by Holbein, or by any one else,—some connoisseurs unhesitatingly assert. Colonel Meyrick kindly sent it to the Manchester Art Treasures Exhibition of 1857. Thanks to Colonels De Bathe and Meyrick, of the Scots Fusilier Guards, and to

* See p. 405, *ante*.

Mr. John C. Deane, the *sole* father of that triumphant exhibition,—a great success, with a money balance on the right side.

When Mr. Redgrave *revises* his catalogue for a new and (we trust) cheaper edition, he will possibly think it well to insert, or refer, to a letter (printed by Sir Henry Ellis, 1st series, ii., 122), written by Nicholas Wotton to Henry VIII., and dated Duren, 11th August, 1539:—"Your Grace's servant, Hanze Albein, hath taken th' effigies of my Lady Anne and the Lady Emelye, and hath expressyd theyr imaiges very lyvelye." Wotton and Berde were the two persons deputed to negotiate Henry's marriage with Anne of Cleves. The passage just quoted we have copied most carefully into our own annotated Walpole.

2,082. Henry VIII. Oil. Lent by Earl Spencer.

2,093. Portrait of a Gentleman, in a furred dress. Lent by the Earl of Shaftesbury.

2,627. Portrait of a Lady, "Anno Ætatis suæ 23." Her coat of arms is affixed to the case. Card. Lent by Mr. J. Heywood Hawkins. Here we renew our cry for Herald's College and Mr. J. Gough Nichols.

2,655. Hans Holbein, the painter. Oil. Lent by Lord Spencer.

2,664. "King Edward VI., in a black dress and jewelled cap, soon after his father's death. Set in a case, enamelled on gold. 1547." So runs the catalogue, p. 248; but at p. 293 of the same catalogue we are told, and truly, that Holbein died in 1543, four years *anterior* to his having painted this spurious Holbein. The portrait is lent by Mr. Henry F. Holt.

2,946. "Charles V., emperor of Germany, wearing the badge of the Order of the Golden Fleece, when a youth, about 1520." A very old Parr of a youth, Messrs. Whittingham & Wilkins, printers.

2,947. Queen Anne Boleyn.

2,948. King Henry VIII.

Both lent by Mr. William Mosely.

Now, of these twenty *half* genuine, half doubtful, Holbeins, Dr. Wellesley and Mr. Sackville Bale possess *the very finest*.

Of Nicholas Hilliard, born at Exeter in 1547, four years after Holbein's death, and the second great name in point of time (if not of skill) in miniature art, or limning in little, the Kensington Exhibition supplies *twenty-nine* examples:—

103. "Portrait of a Gentleman in a ruff and white dress; ascribed to N. Hilliard." Oval, and, as we marked on the spot, "genuine." Lent by Lord Cremorne.

308. Queen Elizabeth. Enamelled frame of the period. Lent by Mr. Samuel Addington, and a "gem" we pencilled in our catalogue when we stood admiringly before it. Blue background.

309. "Mrs. Holland, Maid of Honour to Queen Elizabeth," signed and dated, "Ano. Dni. 1593. Ætatis suæ 26." Blue ground.

360. "Lord Keeper Coventry (died 1640), ascribed to Nicholas Hilliard." This miniature, lent by Mr. Wm. H. Pole Carew, of Antony, in Cornwall, will not stand the test of dates. Hilliard, to whom it is given, died in 1619, and Coventry was not lord keeper in Hilliard's lifetime. The Latin inscription on the portrait seems genuine.

632. Nicholas Hilliard, the miniature painter, by himself, 1547-1619; signed and dated, "N. H., 1550." To this we say, very early ripe, Master Hilliard; here is a miniature by Hilliard, limned by a precocious boy of only three years old. Lent by Mr. Hollingworth Magniac, as is—

651. Lady Arabella Stuart (very fine), from Lord Wilmington's collection, and from the Strawberry Hill collection.

805. Queen Elizabeth, in a very richly-jewelled dress and lace ruff; from the Strawberry Hill collection. Lent by by Mr. John Jones.

*** Covetable.

1,009. Lady Arabella Stuart. Oval; *very fine*; blue background. Lent by Mr. William Maskell.

1,175. Nicholas Hilliard, miniature painter, died 1619; a copy by G. P. Harding, of the Penshurst miniature engraved in Walpole's Works; but more satisfactorily in Dallaway's Walpole.

1,488. Elizabeth Spencer, Lady Hunsdon, wife of George, second Lord Hunsdon. Oval, in filagree gold frame; very fine. Lent by Lord Fitzhardinge.

1,578. Anne of Denmark, Queen of James I. Lent by Lord Wharncliffe. Card. Oval, genuine, and good.

1,596. Lady Shirley; represented with her hair falling.

1,602. The Protector Somerset, dated 1560. In 1560 Hilliard was only thirteen. Somerset was beheaded in 1552. "Facts are stubborn things." "Pass this by," as auctioneers are at times obliged to say, "and bring on the next lot, No. 1,642."

1,642. Portrait of a young gentleman in a black dress and lace collar, his hair hanging loosely down on his left shoulder. Inscribed, "Ano. Dni. 1594. Ætatis suæ 20." Oval, very fine; without even a motto, and therefore, unhappily, without any clue to identification.

1,646. Lord Hunsdon, cousin to Queen Elizabeth, who made him her Master of the Horse. Inscribed "Ano. Dni. 1605."

*** Hallo! Committee of Council on Education, Mr. Sackville Bale (to whom this miniature belongs), and Mr. Samuel Redgrave: look at the 36 ft. high tomb of Queen Elizabeth's cousin Cary, Lord Hunsdon, in Westminster Abbey (chapel of St. John the Baptist), and there, as elsewhere, you will learn that Queen Elizabeth's cousin, Lord Hunsdon, died in 1596, nine years before the date on the miniature. Who that has ever seen, will readily forget the Sherborne Castle picture of Queen Elizabeth's procession to Hunsdon House?

1,652. Mary Stuart, Queen of Scots. Inscribed "Ano. Dni. 1579. M.R." When Mr. Albert Way has passed his judgment on this miniature of Fotheringay Mary, we will give our own.

1,715. "Sidney's sister, Pembroke's mother." Lent by the Rev. William Vernon Harcourt.

We should like to know the genealogy of this Hilliard.

1,814. Queen Elizabeth. Lent by the Earl of Derby. Oval and very fine; but seen to ill advantage in its modern and tasteless setting.

1,817. Sir Francis Drake. Inscribed "Ætatis suæ 42, Ano. Dni. 1581." Lent by the Earl of Derby, and very fine. Same remark about the setting.

2,062. Lady Montagu, mother of Anne, wife of Dudley, fourth Lord North. Lent by Colonel North, M.P. Fine.

2,012. Dorothy, Lady North, mother of Dudley, *third* Lord North. Lent by Colonel North, M.P. Exquisite.

2,068. Portrait of a child in a richly-quilted dress, with the inscription "Anno Dni. 1578, ætatis 5." Lent by the Earl of Shaftesbury.

2070. Portrait of a gentleman in a richly-decorated gorget, with the inscription "Anno Dni. 1578, ætatis 32." "This," Mr. Redgrave says, "is evidently the portrait of the father of the child No. 2,068." Lent by the Earl of Shaftesbury.

2,346. Mary Stuart, with her son James VI. of Scotland, with a view of Edinburgh in the background,—and

2,347. Henry VIII., with his son Edward VI.

Both ascribed to Hilliard, and both lent by Miss Wilson.

2,565. Queen Elizabeth. Ano. Dni. 1564. Ætatis suæ 25. Lent by Lady Sophia Des Vœux.

On this we remark; painted when Hilliard was 17. We must give a Lord Burleigh shake of the head against this being a genuine Hilliard of England's Elizabeth.

2,629. Mary Stuart, Queen of Scots. Lent by Mrs. Naylor Leyland. The catalogue gives a descent of this miniature from *one* of the maids of honour to Queen Mary down to the present time. Our *belief* is, that Hilliard never saw the beauteous Stuart, and that Mrs. Naylor Leyland's miniature is not a Nicholas Hilliard.

2,945. Portrait of a gentleman, inscribed, "Ano. Dni. 1628. Ætatis suæ 41." This small oval the catalogue ascribes to Hilliard. It is beautiful, with a blue background in Hilliard's manner, and with much of his marvellous delicacy of finish. Lent by Mr. William Mosely.

The pedigree of Hilliard, given by Dallaway, from the archives of Heralds' College, presents and records "Laurence Hilliard," living in 1634, as the only son of Nicholas Hilliard and his wife Alice, daughter of John Brandon, Chamberlain of London. For this Laurence Hilliard we had a search the other day in the Prerogative Will Office of Canterbury (off Doctors' Commons, in London). We were well repaid for our trouble.

Laurence Hilliard, of St. Bride's, Fleet-street, in London, made his will 21st February, 1640. Two bequests particularly struck our attention.

To his son Brandon Hilliard he bequeaths the Earl of Leicester's picture, in a jet box, drawn in his cloak, with a cap and feather.

To his son Thomas Hilliard, he bequeaths his grandfather's picture, in an ivory box, with a crystal over it.

To his daughter Laurence he bequeaths the excellent limned portrait of Mr. Hearne, "which I value at 20*l*."

He particularly mentions "a full-length of Queen Elizabeth in a jet box," his "own portrait when young," his lands in St. John of Jerusalem (Clerkenwell, of course), and his "pen of unicorn's horn" (some Scottish antiquary can doubtless tell us what such a fabulous treasure was like)—the pen with which he worked on aces of hearts and tens of diamonds.

So little is known of Nicholas Hilliard (the best connected account is in Mr. Wornum's edition of Walpole) that some *new matter* about so great a name in English art will, we are willing to think, find a foundling asylum in the columns of the *Builder*.

In the accounts of the Treasurer of the Chamber to King James I., Mr. Peter Cunningham discovered the following entries:—

"To Nicholas Hyllyard his Ma^{tie} Lymner uppon the Councell warrant dated at the Courte at Hampton Courte 28 December 1603 for his paynes and travell beinge appoynted by direction to make certayne pictures of his Ma^{ties} w^{ch} were by his highnes gyven unto the Duke of Denmarks Embassador.—xix$^{li.}$ x$^{s.}$"

"To Nichas Hilliarde upon the Lorde Chamberleynes warraunte dated 31 January 1614 [15] for a picture of the Prince [afterwards Charles I.] in lynnen drawen to the waste with a riche chrystall thereon and deliured to Mr. Murray his highnes Tutor.—viij$^{li.}$" *

Among the Augmentation Records is a lease to Hilliard, for twenty-one years, of the Crown manor of Poyle, in Stanwell (Middlesex), "in consideration of his paines in engraving the Great Seal of England."

At Nutwell Court, near Exeter (Exeter was Hilliard's birthplace), is a miniature of Queen Elizabeth dated 1575, and two jewels exquisitely set in gold, presented by Queen Elizabeth to Sir Francis Drake. Did Hilliard, who was a goldsmith, ever work as a goldsmith?

The following extract from the accounts of the Treasurer of the Chambers to King James I., is *here* printed or referred to for the first time.

"To Laurence Hilliard His Mai^{es} Lymner upon the Councills Warr^{t}. dated xvij^{o} Apr 1624 for five pictures by him drawen as appeareth by a Bill of particulars.—xl$^{li.}$" †

That is at 8*l*. a piece, so that his charges were the same as his father's.

In an Establishment Book of 1641, we were pleased to find preserved in the Lord Chamberlain's office, the king's "Limners" are described as Laurence Hilliard and Peter Oliver.

The name of Laurence Hilliard, as *a painter*, is not to be found in any edition of Walpole.

Here we must pause for a week.

THE HALF-TIME SYSTEM OF EDUCATION.

WORKING MEN'S CLUB MEETINGS.

AT the fifth of these meetings, held on the 13th inst., Lord Brougham took the chair, and Lord Lyttelton, in introducing the subject of the evening, which was "The Extension of the Half-time System of Education to Classes of the Population to which it does not now apply," dwelt upon the real identity of interests which exists between masters and men, and which had been denied at a previous meeting. Were it otherwise, these meetings, which were intended to unite the different classes, would be useless. After paying a compliment to the veteran chairman, as having been the hardest "working man" in England, Lord Lyttelton proceeded to point out how the education which such men as Lord Brougham, who worked with their brain, received, enabled them to get through a vast amount of work, and contended that if those who worked with their hands were also better educated, it would be an immense advantage to them in every way. Now by the half-time system, which compelled every parent who chose to send his child to work, also to send him or her half the day to school, a very useful compromise had been effected between the demands of labour and education. He must, however, chiefly confine his remarks that evening to the question of the desirability of applying that system to the manufactories of Birmingham and Staffordshire. The inhabitants of Birmingham possessed, as they were, of many excellences, were not, however, remarkable, perhaps, for humility, and he believed they had something to learn respect-

* Accounts of the Treasurer of the Chamber to King James I.—Cunningham's "Revels at Court," 8vo. 1842, pp. xxxiv. and xliv.

† MS. Accounts of the Treasurer of the Chamber.

ing the frightful ignorance of many of the youthful operative population, which was most dangerous and disgraceful to those who allowed its existence. The existing state of things had been the subject of a Parliamentary commission, which had published the results of its investigation in a "Blue Book," from which Lord Lyttelton then made several startling and interesting quotations. Among the cases adduced, was that of a boy eleven years old, who had never heard of either Scotland or America, and thought the Queen was the Prince of Wales. The hours and nature of the work of these children and young persons precluded all opportunity of learning. He gave an instance of a little girl engaged in a brickyard, near Birmingham, from six a.m. to eight p.m., only having fifteen minutes for breakfast, and thirty minutes for dinner, no time for tea, and during one day she would have to catch and throw to her neighbour 15 tons of bricks. Yet this poor child did not murmur, but said she was quite willing to work hard, and that she was looking forward to a time of rest when she should be an angel in heaven. The half-time system of education, as carried out in the manufacturing towns of Lancashire and Yorkshire, had resulted in the increased education, and consequent improved life and conduct, of their inhabitants, as had been manifested during the late cotton famine, and in many other ways. His lordship concluded by urging that it would be for the best interests of all other districts similarly circumstanced to follow their example, and to seek for an extension of the half-time system of education for themselves. Lord Brougham said that it was a great satisfaction to him to preside at one of these meetings, and then proceeded to observe that by means of the half-time system of education a great saving of time, labour, and of the faculties of both body and mind had been effected; inasmuch as five hours of education when the mind was fresh, or five hours of work when the body was fresh, were equal to ten hours of either education or work, if during the latter hours the body and mind were exhausted.

THE ELEVATION OF MANUAL LABOUR.

IN the course of Mr. Chadwick's recent lectures on the Condition of the Wage Classes, he said:—In want of trustworthy educated men among the wage classes fitted to fill the many responsible situations which the management of machinery requires, it would be desirable that some of the salaried classes should overcome the prejudice against manual labour, and take those occupations which ought to be elevated in the social scale. Such positions, for instance, as those of a locomotive engineer, or the engineer of a steamship, on the proper discharge of whose duties many lives and a large amount of property depend, ought to rank so high that an ensign in the army, a clerk, or a poor curate should not feel himself degraded by taking the appointment. One of the effects of machinery and of the division of labour had been to render apprenticeships unnecessary. When a carpenter was required to do all kinds of work in wood, even to the construction of a circular staircase, there might have been some reason for a long apprenticeship; but now that his work is confined to two or three things, and so much is made by machinery, there was no longer any necessity for that. He animadverted also on the baneful effects of excessive labour in childhood and in manhood, which, in addition to overcrowding, had, he said, been the means of shortening the duration of life among the working classes nearly twenty years. The sanitary regulations that have been adopted to improve drainage, to establish dwellings for the poor, and to prevent overcrowding, had already produced an alleviating effect, and diminished the amount of disease one-third; and further improvements are being carried out which would add to the health and longevity of the wage classes in large towns. The effect of improved processes in agriculture will, in Mr. Chadwick's opinion, be even greater than it has been in manufactures. Comparing the general condition of the English wage classes with those of other nations, Mr. Chadwick said that their superiority might to some extent be attributed to race, Anglo-Saxons being able to do more work than most other races. He considered that two Englishmen could do the work of three Frenchmen; and to that concentration of force in the physical condition of the people he thought might be traced the cause of the power of this country. A difference in the physical and mental powers is also to be observed in the inhabitants of different parts of England; those in the north being generally superior, both physically and intellectually, to the natives of the southern counties.

THE WASHING-DAY IN TENEMENTED HOUSES.

"Thump, thump, scold, scold,
Thump, thump, away;
There's little pleasure in the house,
Upon a washing-day."

MANY a poor man, with an aching heart and dissatisfied mind, has with reason hummed the well-known song, of which we give the chorus, in most homes of the working classes. When this needful sanitary operation is attended to once a week, it is a time of discomfort and unpleasantness; but in most of the tenemented dwellings, especially in the metropolis, there is a washing on almost every day of the week, and in more ways than so far as the mere inconvenience is concerned,—the women are put to shifts in consequence of the present ill arrangements. We will very briefly jot down a few of these, as they have been given to us by a respectable woman who has been exposed to much painful experience.

Quarrels arise amongst the numerous inhabitants of a house respecting the day on which they can have the use of the copper, and about the lines and drying apparatus in the space which is often far too small and very inconvenient. It is by no means an uncommon, though a bad practice, in order to save fuel, time, and so on, for one woman to leave the hot dirty water in which her clothes have been washed for the use of another family: the mischief of this in cases where skin and other disorders are prevalent is evident. It is not unusnal for the clothes in which the sick have lain, or in which persons have died, to be kept waiting for the washing-day in the rooms in which families live, or in the washhouse, which is accessible to every person (old and young) from the various apartments.

There is also a frequent scarcity of water, owing to the causes to which we have so often before had reason to refer. There is, however, one point to which we must direct especial attention, viz., the practice, which is far too common, of the person who rents the house and sublets the chief part, taking in large washings from two, three, and even more families. Sometimes others in a house imitate the example which is set: this causes the water-supply to be soon exhausted, even if care has been taken to provide butts of sufficient size.

Notwithstanding the various appliances which modern chemists have placed at hand for the use of washers of family clothes to save time, and, to a considerable extent, prevent the wear and tear to which many articles are subjected by some women, the old fashion is still persisted in, and they rub and scrub away, chattering, or, what is worse, fighting, while the neglected children are roaring in some part of the premises, or exposed to the unprotected fires of the rooms, or turned upon the street, where the danger of contamination, or of being run over by some of the numerous carriages, and other risks, await them.

With one kind of muddle and another, the washing of a family, where there are four or five children, usually occupies the chief part of a day, when all is properly provided, without taking into account the drying, ironing, and mangling. At one of the public baths and washhouses, the same number of articles could be thoroughly washed and dried in two hours. The cost of hot-water steam drying-apparatus would amount to 3d., and so on at the rate of 1½d. per hour. Here a woman, shut up in the box which she has chosen, can proceed with her work without interruption; but so much have persons been accustomed to the old method, that we fear that the isolation which most people would consider an advantage, is one of the objections made to the public washhouses. But it is unfortunately the case, that many have no opportunity of testing the advantages of these establishments. In the great parish of Islington there is nothing of this kind. From various quarters we hear of the pecuniary success of baths and washhouses, if placed in well-selected situations, properly but economically arranged in the first instance, and left to stand with their own good and frugal management, without being saddled with the large expenses which were incurred, in a variety of ways, by some societies that have been formed. We have always believed, and are still of the same opinion, that baths and washhouses, if rightly managed, would pay a satisfactory amount of expenses; but it seems to be the duty of the parish authorities to set up those establishments; and we would strongly recommend the matter to the parochial authorities of Islington. Let them gather with great care all the particulars of the washhouses which are at present in existence in the metropolitan districts and elsewhere,—let them fairly take the charges of construction, the working expenses, and the amount of income,—the latter will show an increase as the advantages become known; and, independently of the benefit arising to families by removing the washing from their homes, it will be seen that there will be eventually the advantage of money profit.

In the above brief notes we have said nothing about the annoyance of the smoke, the unpleasant effect of the steam rising into apartments when the washhouse is connected with the lower part of the premises, and the tumbling down of the plaster-work owing to the bad description of material which has been used.

SANITARY MATTERS.

THE *Gazette* announces the appointment of Messrs. R. Rawlinson, J. T. Harrison, and J. T. Way to be her Majesty's Commissioners,—

"For the purpose of inquiring how far the present use of rivers or running waters in England for the purpose of carrying off the sewage of towns and populous places, and the refuse arising from industrial processes and manufactures, can be prevented without risk to the public health or serious injury to such processes and manufactures, and how far such sewage and refuse can be utilised or got rid of otherwise than by discharge into rivers or running waters, or rendered harmless before reaching them; and also for the purpose of inquiring into the effect on the drainage of lands and inhabited places, of obstructions to the natural flow of rivers or streams caused by mills, weirs, locks, and other navigation works, and into the best means of remedying any evils thence arising."

Fever is raging in parts of Bristol. One of the scenes is thus described:—"In a wretched-looking court in Old Bread-street, named Butter-alley, on the bare floor of a room 11 ft. long by 8 ft. wide, lay seven human beings stricken with typhus fever. They comprised a mother and six children, the family of a labourer, who had only left the fever hospital, and was unable to work. A few bits of clothing had been placed by the mother underneath her children, who endeavoured to cover themselves with the rest of their clothes and a portion of their mother's underclothes, while the poor woman herself had only one of her skirts to partially cover her. There was not a single article of furniture in the room."

A report of a paper, by Dr. Clouston, on an outbreak of dysentery in the Cumberland and Westmoreland Asylum (of which he is medical superintendent), caused by the effluvium from a field irrigated by sewage, has been given in the *Medical Times*. The facts are thus summed up:—"The majority of the patients attacked were inmates of the wards on the ground-floor of the asylum, showing that the sewage effluvium is most concentrated near the ground. Little or no wind and a high barometrical pressure would seem to be the most favourable conditions for the injurious effects of the poison to manifest themselves. It would seem to be unsafe to apply sewage in any form to land with a stiff clay subsoil within 350 yards of human habitations. Diarrhœa in its ordinary form may also be caused by sewage exhalations. There are strong reasons for believing that the sewage effluvium which caused dysentery and diarrhœa in some persons may have caused typhoid fever in others. The sewage poison had a period of incubation in most cases before the dysentery appeared: the length of this period was probably from three to five days. The dysentery was of a very fatal character."

It is a remarkable circumstance that since a sanitary corps was organized at New Orleans, where yellow fever has hitherto been apparently indigenous to the locality, and therefore certain to make its appearance at the accustomed season, the summers of 1863 and 1864, and part of 1865, have passed without its reappearance. The sanitary corps on its appointment effectually dealt with the open sewers, the filthy streets, the undrained marshes, and the slimy mud deposits, so prevalent at New Orleans; and the consequent result seems to have been the extinction of the perennial pestilence which has so long made it notorious for its unhealthiness.

NO WATER ON SUNDAY.

THE medical officer of health of the parish of Marylebone, speaking of the centre of Lisson-grove, where a very poor and densely crowded population reside, says,—"The houses for the most part are exceedingly small and badly constructed, whilst provisions for a proper water supply have obviously been but little thought of or cared for. Generally speaking, a family occupies but one room, and it is not unusual to find a house, with only six rooms, inhabited by thirty or thirty-five persons. The cistern, if there be one, is ridiculously small, and generally placed in the worst spot that could be selected, viz., over a filthy water-closet; or if the water receptacle chance to be a wooden butt, it is not unusually rotten and worm-eaten, without a cover, and in close proximity to the dust-bin. At no period of the week can the inhabitants be said to have a sufficient water-supply; but on Sundays, for a long time past, they have been altogether without this necessary element of health and cleanliness; and, to use their own words, 'have been running about in all directions begging for water to cook their Sunday's dinner.' I represented these facts to the secretary of the West Middlesex Water Company, who kindly gave to the subject his immediate attention, and I have very great satisfaction in stating that my request for an additional service, late on Saturday evening, has been most promptly and liberally complied with, for which these poor people express themselves exceedingly grateful." In Marylebone, at any rate, therefore, a step towards the supply of a want we have for years pointed out has been taken. Dr. Whitmore rightly adds,—"By the 67th section of the Act (25th & 26th Vic. cap. 102) vestries and district boards have the power to compel a supply of water to every house, not exceeding thirty gallons per day for each person; and in the interest of those who are compelled to live in these crowded habitations, and with whom an ample water-supply becomes an absolute sanitary requirement, the law should be practically and strictly carried into effect."

THE ALBERT CLOCK-TOWER FOR BELFAST.

SEVENTY-SIX designs were sent in competition, from which a sub-committee selected four, and recommended them to the general committee, in the following order:—

1st. "Veritas," Mr. Barre.

2nd. "Palmam," &c., Messrs. Lanyon, Lynn, & Lanyon.

3rd. Highly commended, — "Bloody Hand," Mr. Linklater.

4th. Commended,—"If so—well," Mr. Barre.

They did not open the letters accompanying the designs, though we have placed the names against the mottoes. The general committee, after discussion, placed No. 2 first.

The following is a description of the selected design:—

"The main features of the design consist of a pedestal, shaft and clock stage, square on plan, surmounted by an octagonal belfry, with spiral termination.

The pedestal is about 21 ft. square (not including the projections at angles), and 23 ft. in height; divided into three minor stages; the plinth being about 5 ft. high, while a moulded string-course divides the remaining portion about equally. Drinking-fountains are placed on three sides of the pedestal, the fourth being occupied by the door giving access to the interior of the building. At the angles of the base pedestals are placed to receive figures. These, however, it is stated, are not essential to the design, and may be added hereafter. Immediately over the recess for drinking fountain, on the side facing High-street, is placed a canopied niche and corbelled pedestal, which may be made complete by the addition of a figure of the late Prince, so as to more particularly identify the structure with its especial purpose as a memorial. In the meantime suitable inscriptions may serve this purpose.

The shaft is of very plain and inexpensive character—a treatment which, by contrast, very much enhances the richness of effect in the upper portion of the design, while the vertical lines formed by the pilasters lead the eye upwards to the clock face. The mean horizontal section of shaft is about 18 ft. square, the height about 70 ft. Each side is divided by angle and central pilasters, of slight projection, into two recessed bays, which are worked out into the full square at top by small corbel arches. The recessed portions between pilasters are pierced at intervals by small lancet openings, which admit light to the interior.

A dwarf stage, about 6 ft. in height, formed by an open arcade on each of the four sides, intervenes between the shaft and clock. At the angles of this stage are placed slightly-detached shafts, supported on angle corbels. The capitals of shafts carry pedestals for figures, which are placed under canopied niches at angles of clock stage.

The clock stage shows on each side a square of 16 ft., the angles being splayed to a slight extent, to accommodate the figures and niches at angles. The clock-face is formed by a perforated stone shield about 11 ft. in diameter, containing an outer ring of twelve quatrefoil openings to receive the numerals, the centre being a large cusped opening, the cusps corresponding in number with the outer perforations. The angle niches and figures have been introduced for the purpose of giving greater width of outline to the structure at this level, so as to arrest the eye as much as possible at the most important point of the building. The centre of the clock stage is about 108 ft. above the street level. This stage is finished at the top by an open-work parapet, stopped at each end by a canopied pinnacle. From this level rises the belfry, octagonal on plan, having coupled pointed arches on each side; the gabled hood-mouldings, over which, embracing each pair of openings, are carried up through a small perforated parapet, which latter is stopped at each angle of the octagon by a small pinnacle. The top of this parapet is about 12 ft. above that of the clock stage. The belfry is covered by a spiral roof enriched by pinnacled dormers, and surmounted by a small single-bell cot with projecting gallery of iron, which, with its pointed spire and ornamental iron vane, terminates the structure, the whole reaching to a height of 160 ft."

PARIS.

FOR some days past considerable attention has been directed to the submarine infernal machine invented by Vice-Admiral De Chabannes, and tried lately at Toulon. The subject was brought before the Chamber of Deputies by M. de Kervéguen, who stated that an iron-plated ship of war, costing years of labour and immense sums of money to complete, could in a few minutes be annihilated by one of these torpedoes, so *foudroyans* were the results of the experiments. The commissary of Government, M. Dupuy de Lome replied, that although these engines were not new and had been in use for many years, it was impossible to deny the importance of all machinery of war of that class, yet that activity in the construction of iron-coated vessels should not in consequence be diminished.

The celebrated tenor, Duprez, is to re-appear on the stage at the Paris Opera-house, in September next, in an opera of his own composition, entitled, "Samson." He is to have it all to himself, the direction of the *mise en scène*, the choice of the artistes, and the conducting of the rehearsals.

The municipal administration of Paris has purchased the property on which the source of the River Seine is situated, with a view of erecting an appropriate and durable monument, which is being designed in the form of an ornamental grotto. It was the Parisian *nautes*, a powerful corporation of river merchants of the Seine who laid the foundation of the municipal body of Paris. The source of the river is not at Saint-Seine, as is commonly supposed, but near Chanceaux, a small village in the Côte d'Or, situated on the high road from Paris to Dijon. Turning to the right into the interior of the country, after about an hour's walk, a charming valley is reached, between two mountains forming a portion of the Côte d'Or, in which a stream rises, and, descending rapidly, unites with other rivulets. This is the Seine, which, after a race of 497 miles, all through French soil, throws itself into the sea. In 1763, at the source of the Seine, was discovered a small bronze galley, now preserved in the Dijon museum. The president Ruffey, an archæologist, fancied he recognised in this relic an *ex-voto* anciently placed in a small temple elevated in honour of the Seine. Search was instituted, and excavations, as we some time ago mentioned, proved his conjectures to be a certainty, by the discovery of statues, shafts of columns, and a great number of Roman medals. The name Seine, or as it is anciently written *Sena, Sequana*, is said to have been derived from the Celtic *Sin-an*, or *Soyh-an* (gentle river, peaceful water).

The drivers of the Paris *voitures de place*, or hackney coaches, struck for higher and more regular wages on the 16th instant, to the great inconvenience of the population. As the Compagnie Impériale des Voitures de Place is a monopoly private enterprises cannot interfere and offer accommodation. The number of coaches circulating through the town has, however, been on the increase these few days past. Among the considerations upon which *Messieurs les cochers* base their demand, they set forth in the first place the amounts retained from their daily wages:—Cleaning the horse, 25 cents; washing the coach during the night, 25 c.; accident fund for those occasioned by the drivers, 10 c.; relay during the day, 15 c.; unharnessing the horses on re-entering, 15 c.; damage, and wear and tear, 20 c.; garçons at the cab ranks, 10 c.; daily stoppage for clothes, fines, &c., 50 c.; total, 1 fr. 50 c. Among the ten articles specified in the circular issued by the drivers, the principal seems to be that demanding a fixed clear salary, and no deductions, of 6 francs per day of fourteen hours, and 2 francs additional for every night passed at balls, soirées, or under other orders.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

AT the meeting, June 14th, Mr. J. R. Planché, Rouge Croix, in the chair, Lord Boston exhibited miniatures of Charles I., and James, Duke of Monmouth, formerly in the possession of Cardinal York; and Mr. Geo. Vere Irving produced rubbings of the chair of Cardinal Beaton, which has recently passed into the hands of Mr. Sim, a member of the Association. Mr. J. T. Irvine sent a coloured drawing of the Roman pavement found at Bath in 1864; also sketches of further architectural remains from the Church of Bradford-on-Avon, consisting of portions of Saxon crosses, richly sculptured with interlaced strap-work and bases, and capitals of Norman columns; also a sepulchral slab of the fourteenth century, and a sketch of the north aisle of the church, with thirteenth-century work.

Mr. Cuming read some notes on "Ancient Bone Spear-heads," with illustrations from his own collection and those of Mr. Gunston and the Rev. Mr. Simpson.

Various other exhibitions having been made, an elaborate paper, by Mr. F. J. Baigent, of Winchester, was read, detailing the various wall-paintings found during the restorations of the Hospital of St. Cross. Upwards of thirty beautiful drawings illustrated this communication, and will be published by the Association. This occupied the remainder of the evening, when the chairman adjourned the meeting to November next, reminding the members of the congress to be held at Durham in August.

PHOTOGRAPHY IN PRINTING INK.

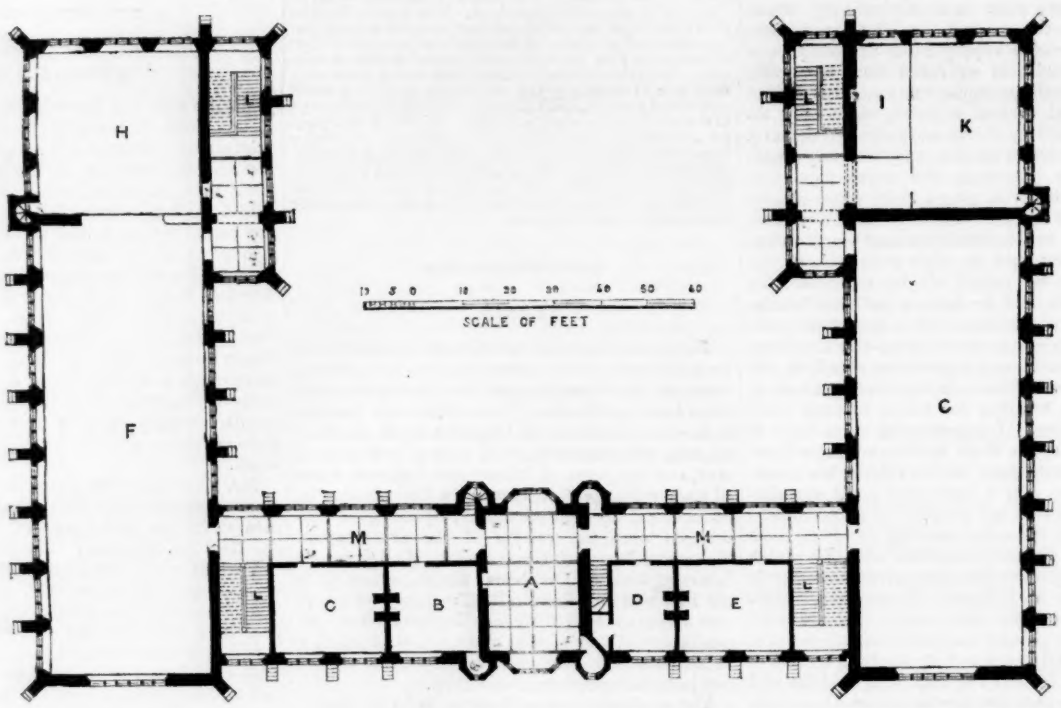
MR. JOHN POUNCY, the well-known photographer, of Dorchester, was specially invited by Professor Dawson to give a series of experiments in his newly-patented process of printing photographs, direct from the negative, in printer's ink, before a select party of eminent professors, at King's College, London. Among those present were Professor Dawson; Dr. Miller, F.C.S.; Dr. Wallich; and Messrs. G. Hadow, F.C.S.; Benjamin Ferrey; G. Coles; G. R. W. Thomas; J. Sandford; &c. The whole manipulation of the process was successfully carried out by Mr. Pouncy, showing the ease with which the pictures produced from the ink could be transferred either to paper or any other substance. The *rationale* of the process appears to be that the light hardens the ink on the surface of the paper, just in proportion as it passes through the negative, the part not acted upon by the rays remaining soluble, and being easily removed by washing with turpentine. The company present expressed themselves highly satisfied with the results, and a vote of thanks was accorded to Mr. Pouncy. He also exhibited specimens of photography in ceramic colours for transfer to biscuit wares, which were much admired. The fact of Mr. Pouncy having been awarded the silver medal and 400 francs from the Photographic Society of France, and the silver medal of the Photographic Society of Scotland, is a sufficient testimony in favour of a process which we have before this occasionally brought under the notice of our readers, and which appears to be one of much value, as advancing the permanency of architectural representation.

MALVERN COLLEGE.

IN accordance with the intimation that accompanied the view and account lately given in our columns of Malvern Proprietary College, built from the designs of Mr. Hansom,* we publish in this number an enlarged view of the entrance-tower, and plans of the two principal floors of the building. The College, it will be remembered, is to accommodate 600 boys. The architect, in laying down his plans, appears to have taken as a *modus* 5 ft., and to have confined himself to various multiples of that throughout.

* See pp. 46, 47, *ante*.

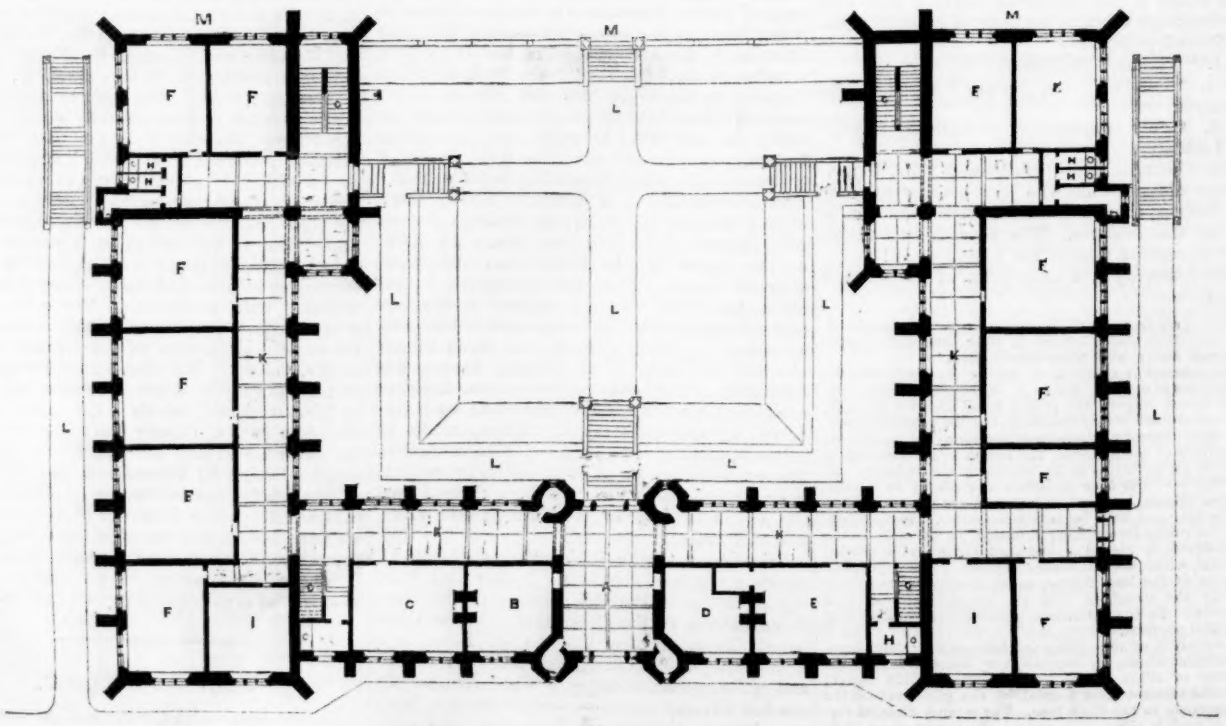
MALVERN PROPRIETARY COLLEGE.



FIRST-FLOOR PLAN.

REFERENCES.

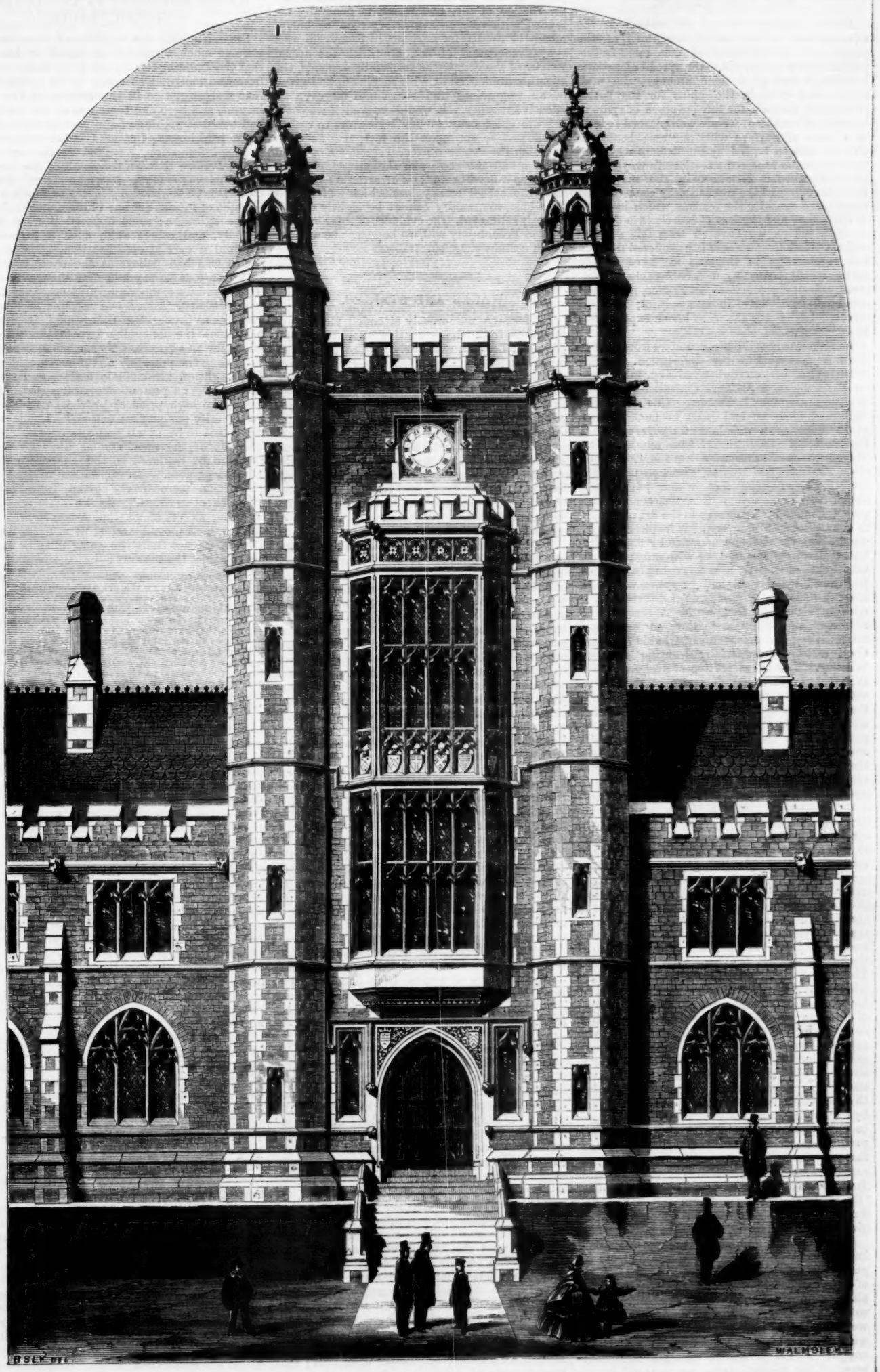
A. Library and Board-room.
B. Head Master.
C. Head Master's Class.
D. Second Master.
E. Second Master's Class.
F. Classical School.
G. Modern School.
H. Drawing and Modelling.
I. Lecture-rooms.
K. Laboratory.
L. Staircase.
M. Corridors.



GROUND PLAN.

REFERENCES.

A. Entrance-hall.
B. Waiting-room.
C. Master's Room.
D. Clerk's Room.
E. Secretary's Room.
F. Class-rooms.
G. Staircases.
H. W.-C. and Urinals.
I. Cloak-room.
K. Cloisters.
L. Walks.
M. Lower Terrace.



MALVERN PROPRIETARY COLLEGE.—MR. C. F. HANSOM, ARCHITECT.

WAR WITH FRANCE.

IN the improvement of our cities,—in the advancement of the social conditions of the people,—in the extension of our manufacturing and other industries,—the spread of artistic knowledge and good taste amongst the multitude, and even in the plans for the better rearing of animals for the purposes of sport or the food of mankind, we are well pleased to keep in a state of warfare with our neighbours the French, and to be led by the defeats which we suffer to make renewed exertions in ways where our failure—for instance, in the matter of horse-breeding, at the recent Derby race—should cause us to consider the reasons which have led to our defeat and the loss of laurels in a department in which we have so long felt sure of victory. Our long success has rendered us careless; and while in England we have in the racing-stable been, to a considerable extent, resting from our exertions, in France, a pupil of our own, as it were, in this respect, no well-directed labour nor the most lavish expense has been spared.

As regards art and taste, our news from France is of a more satisfactory description. In the French Chamber, on the 20th of May, in a debate on the subject, M. Michel Chevalier advocated increased exertions in France. This gentleman remarked that he had been in London three years since as a member of the jury for the International Exhibition. The names of his colleagues on that occasion were MM. le Baron Gros, Merimée, and Dumas, who were present in the Chamber. The fact which particularly struck the French jury was the considerable progress made by foreigners in the art of design, in connexion with industry: "it inspired us with admiration for the efforts made by foreigners; but it likewise inspired us with a fear that we might be outdone. We were impressed and frightened by the marked progress which the English had notably made in good taste." The speaker remarked that up to a recent time, although the English had some celebrated artists, they had not been remarkable for taste. Good taste was especially wanting in their industry. The great portion of designs used in the printed cotton manufactories at Manchester and Liverpool came from designers established in Paris. M. Chevalier said that the English had understood that during this industrial competition with the different foreign nations it was necessary to make great efforts; and they had made them: a museum had been established at South Kensington for the purpose of educating teachers, who were afterwards sent throughout the manufacturing towns of the country propagating good taste. A real revolution had been effected, and the jury were so much surprised at the progress which had been made, that when their report had to be made up, M. Merimée treated this point especially. This, remarked M. Chevalier, is "one of the most curious and best written pages of the six volumes which comprise the general report of the French jury." The following is a quotation from this paper:—"The school at South Kensington has been open for ten years. The corresponding provincial schools (and others which might have been added, to which masters have been sent) numbered ninety; the number of students trained throughout the United Kingdom was 91,386." M. Merimée said that these numbers were for 1862, and must have now greatly increased. M. Michel Chevalier continued,—"With respect to the influence exercised in so short a period by this great institution, we admit freely the assistance rendered to us by our colleagues in the English jury. In answer to our question as to the cause to which the progress so remarkable that year in their manufactures was attributed, they replied, 'The new resources opened to industry by the schools at South Kensington.' I conclude by quoting that 'the study of drawing and of mathematics is the foundation of the instruction which should be given to our students.'"

When we look around and notice the marked improvement which,—during the last five or six years especially,—has been made in many branches of our ornamental industry, and hear such favourable accounts from the French jurists, offered with so much candour, and in such a friendly manner, we cannot sufficiently express the surprise which we feel at the niggardly way in which the supplies for the promotion of art and advancement of the national taste are granted by the House of Commons. Year after year, millions are voted, with scarcely a grumble, for the purposes of that warfare which causes such a vast destruction of life, and which is generally attended with very unsatisfactory results; but, if money be needed for purposes in connexion with the advancement of art, on which the actual welfare of the country as materially depends, the amounts are looked at with suspicion, and given in an ungracious and sometimes in even an offensive manner. It would be well if we could get the chief body of our legislators to understand and to act upon the fact, that notwithstanding the immense natural resources of Great Britain, and the energy of the people, if we do not keep a-head in matters of artistic taste and skill, the actual money loss which will fall on the whole community cannot be rightly or sufficiently estimated. The evidence of this liberally-minded French jury will, we hope, not be without use in certain quarters.

WAGES AND STRIKES.

London.—A numerously attended meeting of delegates from the operative carpenters and joiners of London, was lately held at Cambridge Hall, Newman-street, Oxford-street, to consider the propriety of adopting a memorial to the master builders of the metropolis, requesting an advance on the present rate of wages, 33s. per week, or 7d. per hour. About 100 delegates were present, representing the various carpenters' societies and the principal shops and jobs in the trade. A memorial, embodying the reasons for asking the advance was submitted, discussed, and adopted, and ordered to be presented to the masters forthwith. The house painters have also requested an advance of wages to 7d. an hour.

Sheffield.—In February last, the operative carpenters and joiners of Sheffield gave notice to their employers that, at the expiration of four months from that date, they should require an advance in their wages of 3s. per week in the summer, and 1s. in the winter; and, in addition to this, some alteration in the hours of labour was required. The employers, after some delay, expressed their willingness to meet a deputation from the operatives to discuss the matters; and, accordingly, on the 1st of June, deputations from both parties met, and a long discussion ensued. An adjournment for a week was agreed upon, and it was decided that the employers should be prepared at the adjourned meeting with a proposal to submit to the operatives. Unfortunately, this adjourned meeting was not held, for the operatives, as we are informed, required the masters' proposal to be submitted to them before their deputation could be allowed to again meet the employers. This the latter refused to accede to. The operatives met, to determine what steps should be taken: the attendance was very large, and after a long discussion it was unanimously resolved;—"That at all shops where the advance asked is not acceded to, the men cease work after to-morrow, as no terms have been come to with the employers."

Forfar.—A deputation, who were appointed by the operative masons to meet with the masters on the question of wages, have done so. The masters have agreed to give the small advance required. The masons' wages will now be 5d. per hour.

The strikes of the English operatives, as remarked by a contemporary, are already beginning to bear their bitter fruit. On the very day that a French horse won the Derby, a French locomotive was on its way to England. Even so: in our very strongest branch of industry we have been beaten by the foreigner. The tender of Messrs. Schneider, of Creuset, France, for the supply of locomotives to the Great Eastern Railway, has been accepted, to the astonishment and alarm of many of our engineering firms. It speaks volumes respecting the rapid advance of our Gallic neighbours, and affords a hint which our working men will do well not to despise. The success of the French manufacturers is indirectly due to the great number of strikes which have taken place from time to time in this country, and of which the French artisans, ever watchful, have eagerly availed themselves. A letter in the *Times* states that the French can supply rails of better quality than those supplied by the makers in South Wales; that the French locomotives are better than ours; that French sleepers compete with those from the Baltic; and that a Northamptonshire railway is laid with Belgian rails.

WAGES MOVEMENT IN THE LONDON BUILDING TRADES.

SIR,—No doubt the majority of your readers were as much surprised as myself on learning that the building trade, after its short respite from excitement, was again to be agitated. I read a short notice in the *Beehive* of the 10th instant, and here and there one of the workmen had heard something of the rumour in the firm I am working at; but as I could not get any precise information, I waited for the next issue of the *Beehive* to learn the result of the meeting at Cambridge Hall, Newman-street. In the mean time, I sounded my mates as to what they thought of it, and not one of them was in favour of the agitation: some opposed it most determinedly, and others said, such a proposition required a careful consideration. One or two said it was bad policy, as the trade was in a better state as to pay and time than most other trades, and for some time, at least, they ought to be satisfied. I read the account of the proceedings at Cambridge Hall, and I find the old tale, that the delegates have made up their minds for an advance. No secondary considerations as to the propriety of the movement are to be thought of. Immediate action, and no surrender. "The present flourishing state of the trade, the high price of provisions and house-rent, justify our present action." I believe this movement to be in all respects opposed to the interests of the men, and as ill-timed and as much to be deplored as the Midland masters' "discharge-note." In opposition to that note, quotations were freely given from Smith's "Wealth of Nations." As we have not heard anything as yet about what Adam Smith states on workmen's combination, it will be well to give an extract from the same chapter as was used against the masters:—

"Workmen sometimes, without provocation of any kind, combine to raise the price of their labour. Their usual pretences are sometimes the high price of provisions, sometimes the great profit which their masters make by their work. In order to bring the point to a speedy decision, they have recourse to the loudest clamour, and sometimes to the most shocking violence and outrage. The workmen, accordingly, seldom derive any advantage from these combinations, partly from the superior steadiness of the masters, partly from the necessity which the greater part of the workmen are under of submitting for the sake of present subsistence."

The above extract is applicable to the present movement. The reasons put forth by the delegates are similar to it: trade is brisk, provisions high, masters' profits large; but if such pleas are good, and the masters grant the advance, it will at once change the usual course of the trade. The present rule is, that let work be plentiful or scarce, winter or summer, wages always remain the same, and this fact every workman and master in the trade recognise; but if the rule be broken by the operative, the employer will be justified in reducing the wages twopence per hour in winter, and at any other time when trade is dull, and every honest workman will applaud the master for doing it. It is something wonderful that all the shops said to be represented were unanimous for the advance, whilst I, unfortunately, I suppose, have not come across one man that justifies it, or is at all anxious about the matter, and other workmen I have spoken to, outside the trade, say that the operative builders are going on too fast, and are preparing a rod for their own backs.

There is no doubt but that the primary movers in this affair are those whose interest and business it is to keep up agitation and promote strikes, as strike time is their harvest. They then thrive and fatten on the follies of their fellow men; and, of course, if all others are satisfied, their game is to create dissatisfaction. It is an old saying, when rogues fall out, honest men hear of things which are for their benefit; and I think something is to be learned from the recent charges and recriminations of Odgers, Potter, Applegarth, Cremer, and others. The question which now ought to be uppermost in the minds of independent and intelligent workmen is,—Shall the great bulk of the metropolitan building operatives be any longer dictated to by the few who live by strikes, and are always on the look-out for the weekly levies of their dupes? I should think many recollect the doling out the 1s. or 2s. 6d. a week in the lock-out strike,—how they were snubbed by the great men in that affair, who used to sit swelling in chairs, smoking cigars, and sipping brandy-and-water, whilst the worse than pauper recipients of the miserable pittance had broken up their homes, and starved their wives and children at the bidding of those who took care that their bread should

be buttered on both sides. I was for two years or more in difficulties through that affair, and others have recently stated to me they have not yet recovered the losses resulting from that suicidal movement. There is a difference in the statement of the number of workmen said to be represented at the Newman-street meeting. One paper states 2,000, another 3,000; but there is no doubt both statements are exaggerated. If the shops who sent delegates are unanimous, it must be evident that many of the men are doubly represented through the societies' delegates. But suppose 2,500 carpenters agree to agitate for an advance of wages when they have not one just plea for doing it, are the 20,000 outside to stand looking on until their silence involves them in the strike which is sure to ensue? I think it is the duty of those who disapprove of the affair to at once protest against it; and, if that is not sufficient, to oppose it outright by a direct organized opposition; and let the workmen in other trades and the general public know that the great majority of building operatives has neither part nor lot in the professional strike agitators' movement. The painters and masons, it seems, are also making a stir. I heard it publicly stated a short time ago by one who knows, that the painters' societies do not number 2,000 members out of 14,000; and yet the few pretend to speak in the name of the whole.

* * * * *

AN OPERATIVE.

*** The writer, who adds a long list of reasons against the threatened agitation, for which we are not able to find space, forwards his name and address.

CONSUMPTION OF SMOKE.

IN your last impression "W.H." writes respecting the smoke nuisance. He must not compare a cooking apparatus to a boiler or any other description of furnace. Passing the smoke over a red-hot fire is the most effective way for consuming smoke. Let your correspondent feed a furnace, with a clear fire at the bridge and fire just over the dead plate, and then let a portion of cold air over the fire; he will not see a particle of smoke out of the chimney-shaft one minute after the furnace is once hot. I have applied this plan to boilers, brewers' coppers, &c., and it has given the greatest satisfaction, not by consuming the smoke alone, but saving a vast amount of fuel. W. MAY, JUN.

THE ARCHITECTURAL ASSOCIATION AND THE INSTITUTE LECTURES.

SIR,—In your notice of the last meeting of the Architectural Association, I am reported to have made use of rather strong language in reference to the Institute. I must beg to state, that if the remarks I then made had been fully reported, a very different impression would be given than that which now appears in reading the report. In reply to the question as to why more members did not attend the lectures given by the Institute, I stated, that "I knew from some of our members, that they had come a considerable distance for the express purpose of hearing the lectures, and on two or three occasions found either that there was an Institute meeting, or that there were not sufficient present to warrant the delivery of the lecture, and were obliged to return home, having wasted their evening. Under these circumstances men could hardly be expected to come, to (I might almost say) be made fools of."

I do not know how it could have been gathered from my remarks that I believed the lectures would have been better attended if the Institute had held out greater inducements to the Association. The only inducements they could offer would have been to make the lectures of a more practical character, which would have been of equal advantage to non-members attending them.

I trust your sense of fairness will allow my publication of this letter, as on my own part and on that of the Association of whom I have the honour of being an officer, I should deeply regret it being felt that I had acted in any way ungentlemanly, and especially to a body of gentlemen whose age and position demand my respect. J. DOUGLASS MATHEWS.

*** We do not find much material difference between our reporter's statement and that now forwarded.

MANCHESTER SOCIETY OF ARCHITECTS.

A NUMBER of the leading architects of Manchester have formed themselves into a society, to be called the "Manchester Society of Architects," having for its object the promotion of good feeling between members of the profession, and the establishment and maintenance of a recognised code of professional charges and practice, &c. At the first general meeting, held on the 20th inst., the following gentlemen were elected to serve on the council for the ensuing year:—Mr. Isaac Holden, president; Mr. A. Waterhouse, vice-president; Mr. W. Mangnall, Mr. W. R. Corson, Mr. J. Charlesworth, Mr. E. Salomons, Mr. J. Stevens; Mr. J. Murgatroyd, honorary secretary.

As there is already an Architectural Association in Manchester, we wait to hear something more of the differences in their constitution that render two bodies necessary.

PAYMENT FOR "QUANTITIES."

SIR,—You will greatly oblige if you can refer me to any settled case that will apply to the following, viz.:—I was the architect engaged in a certain work, and supplied quantities. The builder refuses to pay me for the quantities, on the ground that there was no mention on the face of them that they had to be paid for; the fact being that I had omitted to write at the foot, "so much per cent. for quantities." I have been in the habit of making this omission when I intended to charge 1½ per cent., taking it for granted that, when no amount was named, that was understood.

The case has been tried once, and the verdict given against me; and I am on the eve of trying it again.

The same builder has frequently had quantities from me with the same omission, and always paid for them. Your own opinion, in the absence of a case, will be valued. ARCHITECT.

*** There is no settled case, so far as we know, that will apply. An opinion would be worthless without further inquiry, for which we have not time. If the builder did not include charge for quantities in the amount of his tender, it would probably be said that the *proprietor*, from whose representative they came, should pay for taking them out.

COMPETITIONS.

THE directors of the Sheffield and Rotherham Banking Company having determined to erect a new bank in Church-street, Sheffield, adjoining the Cutlers' Hall, invited Messrs. Flockton & Abbott, with Mr. Weightman, resident architects, to furnish designs for the proposed new building, and at their meeting last week accepted the designs of Messrs. Flockton & Abbott, and gave orders to those gentlemen to proceed at once with the work.

MIDDLESBOROUGH EXCHANGE COMPETITION.

SIR,—For the last five weeks I have been expecting to see something in the *Builder* referring to the Middlesborough Exchange competition. Surely every competitor is not in the same position with regard to it as myself, or before this we should have heard more complaints than that which emanated from "A Poor Draughtsman." What I complain of is that, although nearly six months have elapsed since the designs were sent in, and although I have written three letters of inquiry with regard to them, I have not had my plans returned, and have not received any answer to my letters.

I have heard that, although the instructions contained no statement of the committee's prejudices against the Gothic style of architecture, yet all designs in that style were excluded from the competition. My design was certainly in the Gothic style, but I am unconscious of having given any reason for such neglect in any other way, and I should be thankful, sir, if you or any of your correspondents could inform me whether the rest of the designs have been returned. A COMPETITOR.

HINTS IN CONNEXION WITH LOCAL INDUSTRIAL EXHIBITIONS.

SIR,—In your last impression, under the above heading, you make reference to the drawings which contained the imitation Bank of England notes, &c. As the producer of one of these drawings, now exhibited at the West London Exhibition (No. 511 in catalogue), I trust that in justice to myself and fellow-workmen, you will kindly insert this letter.

In the course of your remarks you stated that the execution of these drawings seems to be one of much greater difficulty than it is, and that by means of tracing or transfer paper, &c., a neat and steady-handed person, without artistic ability, might readily produce that which many persons would consider wonderful.

I do not doubt this; but allow me to state that my drawing, or Chinese imitation (as you call it) was not executed by any such means. It was intended as a drawing-study as well as a picture, and was for the most part free-hand, my only aid being drawing instruments.

I have not, as stated, received a prize for this work, as no adjudication has yet been made.

J. J. PICKWORTH.

TO MAKE STONE IMPERVIOUS.

IN reply to "W. B.'s" inquiry "How to make stone impervious," dissolve ¾ of an oz. of bees'-wax in a quart of raw linseed oil over a very gentle fire, taking care not to heat the mixture more than just sufficiently to melt the wax. Apply the mixture while warm to the surface of the stone with a painter's brush, during long-continued dry weather and hot summer days, the intention being that the stone should be dried and warmed as much as possible by the sun previously to the mixture being applied to it. The greater quantity the stone can be made to absorb the more successful will be the result. The surface should be well cleaned, and all soot, dirt, or other loose matter should be removed with a moderately hard brush and bellows before the oil and wax are applied. Any discolouration occasioned by the above treatment will almost entirely disappear in the course of a few months.

P. G. SMITH.

WE may repeat a prescription which has been given more than once in our pages:—Take three-quarters of a pound of best mottled soap, and dissolve the same in one gallon of *boiling* water: spread this hot solution steadily with a large flat brush over the outer surface of the wall, taking care that it *does not lather*. This must be allowed to dry for twenty-four hours, when a solution formed of a quarter of a pound of alum, dissolved in two gallons of water, is to be applied in a similar manner over the coating of soap. The soap and alum mutually decompose each other, and form an insoluble varnish which the rain is unable to penetrate. It should be done in dry settled weather.

The effectiveness of this process has been testified to.

THE CROSBY SEWERAGE.

As additional information to that published in the *Builder* last week respecting the Crosby sewerage, will you kindly state that the result of the inquiry before Mr. Morgan, the Government inspector, was to restrain the Board from fouling the shore, forcing them to adopt an inland route (which we may say is intended to be parallel with the one proposed in our scheme), as also to reduce the cost of the work to the amount of our estimate.

As the Board was forced to go inland, much against their wishes, they naturally, with their supporters, preferred their surveyor carrying out a plan of their own. Hence arise the modifications adopted. The plan has yet to receive Government sanction.

READE & GOODISON.

METROPOLITAN BOARD OF WORKS.

AT a special meeting last week, the clerk read a letter from Mr. Austin, of the Foreign Office, stating that Earl Russell had to renew his complaints of the stenches arising from the Thames Embankment works. The letter was referred to the engineer, with instructions to take steps to abate the nuisance, and report thereon to the Board. The Board then further considered a letter from the Board of Trade as to the material used for filling in behind the Thames Embankment wall, &c. The clerk read a letter that he had written to the Board of Trade, stating that the Metropolitan Board "are of opinion that the immediate backing of the embankment wall should be formed of material wholly obtained from the land, and the remainder of the filling in supplied from the land and from the river, in such proportion as, in the judgment of their engineer, may be best adapted to form a solid embankment, and to complete the work within

the time specified in the contract." In reply, a letter from the Board of Trade recalled the fact that two engineers, mutually appointed by the two Boards, had given it as their decided opinion that the materials dredged by the conservators from the Thames are excellent materials for the embankment. Ultimately a resolution was moved:—"That so long as the material raised from the river opposite the embankment works continues to be, in the opinion of the engineer, suitable for the purpose of the embankment, the engineer be instructed to allow no other material to come into the embankment works, except for the backing of the embankment wall, the cross dams, the material required for puddling, and other necessary purposes." This resolution was carried by a majority of 11 to 3. It was then resolved that a deputation should wait upon the Right Hon. Milner Gibson upon the subject.

CASES UNDER THE BUILDING ACT.

AT the Clerkenwell Police Court, Mr. Albert W. Bryett, builder, of 116, St. James-road, Holloway, was summoned by Mr. John Turner, district surveyor of the eastern division of Islington, for not having carried up the chimneys of two houses he is erecting on the north side of the Grove-road, Holloway, 3 ft. above the highest part of the roof adjoining thereto as required by the statute. Mr. Bryett, jun., attended, and stated that the chimneys were in course of alteration. Mr. Turner said he found them being altered as he came to the court; but that Mr. Bryett had had notice on two occasions to alter them, and to which he had paid no attention. There were four other houses besides those for which he had taken out the summonses.

Mr. Barker fined Mr. Bryett 20s. and costs of summons in each case, and awarded Mr. Turner 21s. expenses in each case.

Messrs. Glenn, builders, of Liverpool-road, were also summoned by the same district surveyor for not having given notice, as required, before commencement of works. Those gentlemen not having attended, the hearing was adjourned to the 23rd instant.

RAILWAY MATTERS.

IT is singular that a fearful railway smash, such as that on the Great Western the other day, is often followed by others almost similar in character, and arising from an almost precisely similar cause. The slaughter in the Clayton Tunnel, some four years ago, arising from neglect in working the signals, was followed, in nine days after, by the collision on the North London system, at Kentish Town, through which fourteen people were killed. Here, again, the non-hoisting of the danger-signal was the cause. We have just had two terrific railway accidents, and both are attributed to the state of the rails. At the inquest on the bodies of the sufferers by the accident at Rednall, the jury found a verdict of accidental death, but they appended to it a series of censures,—first, on the Great Western Company, for not providing better rolling stock and taking greater care of the way; next, upon the engine-drivers, for neglecting signals and driving at too great speed; and, lastly, on the platelayers, for neglect in the manner in which they did their work.

The repairs of lines are necessarily always going on, and should be under eyes attentive to their bearing on the safety of the traffic, and not left to workmen with other business in their heads, and perhaps with brains as fatigued as their hands. The most important signalling is entrusted to these workmen or their gang-leader, and performed in the most slovenly, not to say careless, way,—a flag stuck at the distance the circumstances require according to their notions, necessarily very imperfect, of what is requisite for the safety of the traffic. The London and North-Western Railway Company, we are glad to learn, contemplate appointing a responsible officer over the plate-layers.

If a break could be invented strong enough to stop a train instantaneously, the disasters such a sudden stoppage would occasion would be quite equal to those which might be caused by collision. In an able paper on the subject, in *Cosmos*, M. Flammarion calculates that if a common train, going at the rate of 40 kilomètres per hour, or 12 yards per second, were stopped instantaneously, the passengers would experience a concussion equal to that of a body falling from a height of 19 ft.: they would be hurled against the sides of the carriage with a force equal to that they would be exposed to in falling from a window on the second floor of a house. If the train were moving at the rate of 50 kilomètres per hour, they might as well fall from a height of three pair of stairs; and an express train would, in point of fact, make them fall from a fourth story. Instantaneous breaks are, therefore, not to be thought of, and, fortunately, have not been invented, the impetus of a train, even at half-speed, being much too great for any mechanical means of instant stoppage. A break, though instantaneous in stopping wheels, will still leave the train to go forward a little as a projectile, so that there is no fear of any break ever to be invented, perhaps, being too instantaneous *in imminent danger*. M. Achard, a civil engineer, according to *Galignani*, has invented an electric break, which simply consists in keeping the break or shoes which lie opposite the wheels away from them by means of an electric current: as soon as the latter is interrupted, the break falls upon the wheels, and the speed of the train is slackened in consequence. All the engine-driver has to do is to put his hand on a small interrupter, having much the appearance of a door-handle, and this takes him less time than giving the alarm by means of the whistle. Two small Bunsen's elements are employed to produce the current—they are kept in a wooden box, and the shaking of the train when in motion contributes to maintain their activity. This system has been tried on the Paris and Strasburg Railway, it is said, with success.

The traffic receipts of railways in the United Kingdom amounted, for the week ending the 3rd of June, on 11,946 miles, to 706,217*l.*, and for the corresponding week of last year, on 11,605 miles, to 632,172*l.*, showing an increase of 341 miles, and of 74,045*l.*

PROVINCIAL NEWS.

Worthing.—The foundation-stone of new water-works, baths, and assembly-rooms, was laid last week, at West Worthing, in Sussex.

Walsall (*Staffordshire*).—At a special meeting of the council, the common seal of the borough has been affixed to a contract with Mr. C. Burkett, of Wolverhampton, for the erection of the new town-hall and other works, for the sum of 5,083*l.*, being an increase of 350*l.* upon the sum mentioned in his tender, on account of an error in calculation, proved to be so to the satisfaction of the town-hall committee, and being an allowance of such tender of 50*l.*, in consideration of the dressings above the plinth being executed in Attleborough stone instead of Hollington stone.

Penarth (*Cardiff*).—The Penarth Dock, near Cardiff, has been opened.

Liverpool.—The town council have resolved to expend 810*l.* in alterations necessary to make the robing and dining rooms at St. George's Hall more convenient for the use of the members of the bar.

Maldon.—Mr. Bentall's chimney, an elevated shaft at Heybridge, which is visible for miles round the country, has been finished. The chimney is 116 ft. high, contains 75,000 bricks, and has been built for the purpose of working a new nut-making factory, which will be extensive. The shaft was plumbed, and it was found the central deviation did not amount to half an inch.

Gorton (*Manchester*).—The chief stone of new offices for the Gorton Local Board of health has been laid. Messrs. Whyatt & Redford, of Manchester and Heywood, architects, prepared the designs. The building is to be erected upon a plot of ground at the corner of Hyde-road and Kirkmanshulme-lane. The main material to be employed is common bricks, set in old English bond, with dressings of Grinshill stone. The principal exterior decoration is the filling in to the spandrels of the upper windows in different coloured tiles; the arches being formed with ornamental brickwork, parti-coloured. A "Ringhiera," or balcony, is introduced to the board-room, from which constituents can be addressed at election times, and broad steps have also been placed at the entrance for a like purpose. In the centre of the building is placed an octagonal clock-tower. The offices will be situated on the ground-story; and a hall will contain stone steps leading to the board-room on the first floor. This room will be 32 ft. by 18 ft., having an open-timbered roof, and adjoining it will be a waiting-room. The structure is an adaptation of the style in which, during the thirteenth century, were built the "Broletti," or town-halls of the Lombardic cities, as Monza, Como, &c. Mr. T. Clay, of Audenshaw, has undertaken the contract for the sum of 1,443*l.*, exclusive of fittings. The probable cost of the building, when completed, will be about 2,000*l.*

Endcliffe (*Sheffield*).—We are asked to add to our notice of Mr. John Brown's mansion, at Endcliffe, Sheffield, that in addition to the sliding iron shutters described, nineteen or twenty of Messrs. Clark & Co.'s patent self-coiling shutters, in one sheet of steel, were fitted to windows.

Harrogate.—The new Post-office buildings have been opened for business, though scarcely completed. They are situated in one of the most frequented of the roads diverging from and within about 170 yards of the railway station, and occupy a position exactly central in the district. The new building has been erected by the Victoria Park Company, and forms a very prominent feature on the angle of James-street and Princes-street, presenting at the angle a portico-entrance to the post-office, money-order office, savings bank, and postmaster's residence. It forms part of a pile of new buildings, having a façade towards James-street of about 300 ft. in length, and towards Princes-street of 100 ft. The style is Italian, treated so as to show to advantage the building stone of the locality, which, being capable of being quarried in large and massive blocks, offers unusual facilities for producing effects of light and shade. Red bricks have also been introduced. The principal room of the Post-office,—size about 30 ft. by 20 ft.,—is lighted towards James-street by three semi-circular-headed windows, divided by stone columns with carved capitals. The adjacent new buildings are of similar design. The arched windows of the Post-office are repeated the whole length of James-street and Princes-street; the James-street consisting of a series of shops with dwelling-houses attached; the whole mass of buildings terminating with a projecting stone cornice and parapet continued along both streets. The architect of the Victoria Park Company is Mr. J. Hirst, a Yorkshireman, now resident at Bristol; and Mr. R. Ellis, the contractor.

North Shields.—The foundation stone of an Oddfellows' hall has been laid here. The edifice is to be built on the north side of Saville-street West. The material will be brick. There will be several shops on the ground-floor, and a large hall and other rooms above. Mr. T. Forrest is the architect.

CHURCH-BUILDING NEWS.

Great Saling (*Essex*).—The church of Great Saling has been re-opened after restoration. The roof has been constructed of new open timbers, in place of lath and plaster. The walls and windows have been restored, the tower cleaned, and the stone-work repointed: there is also a new chancel window, below which is a stone reredos; and the pavements throughout are all new encaustic: the benches in the chancel and over the nave are of deal, stained and varnished. A spire was to surmount the tower, but for the present has been abandoned. The works have cost upwards of 1,000*l.*, raised partly by rate. The church now contains 360 sittings, partly free. The architect was Mr. R. J. Withers, and the building works have been done by Messrs. Parmenter & Son, of Braintree.

Cuckfield (*Sussex*).—The new church of St. Wilfrid, at Hayward's Heath, has been consecrated. Mr. W. Sergison, of Cuckfield Park, gave the site; and the Misses Dealtry headed the subscription list with 1,000*l.* (the late Miss Ann Dealtry also bequeathed 500*l.*). The building stands upon high ground, in the middle of Sussex. The architect was Mr. Bodley; and the builder, Mr. J. Fabian, of Brighton.

Northampton.—St. Katharine's Church, which has for some time past been undergoing several improvements and renovations, has been re-opened for divine service. The principal portion of the work has been confined to the interior. A stained-glass window in the chancel, as an inscription beneath states, "was erected by subscriptions, collected principally in small sums, by twelve ladies of the congregation." The window was made by Mr. Wailes, of Newcastle, and the subjects are, our Saviour in the centre, with the four evangelists on the sides. In the lower compartment are figures of John the Baptist, Peter, Paul, James, and Jude, and the upper compartment is filled with figures of angels. Over the window are the words, "Glory to God in the highest, and on the earth peace." The heads of the side windows it is intended to fill in with ornamental glass, but this work is

not yet completed. The whole of the ceiling has been stencilled. The chancel ceiling has been painted in blue and gold, and the two figures on each side of the chancel arch have been gratuitously gilt by Mr. H. J. Atkins. The whole of the ornamental work in the ceiling and over the windows, we understand, has been done at the expense of the incumbent, the Rev. R. C. King. A portion of the walls has been coloured grey, and between the line of colour and paint there is a running stencilled border. The whole of the seats on the ground-floor have been taken down, and new seats, lower, with sloping backs, and tracery heads in the panels, have been substituted. The contractors for the woodwork were Messrs. Clark & Heap; for the painting work, Mr. Buswell; and for the colouring, Mr. Banks; and the whole of the work has been carried out under the superintendence of Mr. Ingman, of Northampton.

Eydon (*Northants*).—The church of Eydon has been re-opened. The work of restoration commenced about eleven months ago, and has been carried out by Mr. Watson, of Napton, under the superintendence of Mr. R. C. Hussey. The high inconvenient pews have all been removed, and their places supplied by low open seats. The tower arch, which was also blocked up by a gallery, has been thrown open, and the belfry floor levelled. Two new windows have been placed under the north aisle, a vestry has been erected at the east end of it, and a new roof has been placed on the chancel. The south aisle and porch are new. The pulpit and lectern are both new. The windows in the chancel and on the west end of the tower, are all to be filled with stained glass.

Cold Ash (*Thatcham, Berks*).—The new church here has been consecrated. The edifice is situated on a high hill. Mr. C. N. Beazley, of London, furnished the design. The tender of Mr. Hollis, of Windsor, to erect the building for 1,750*l*., was accepted. The building, which is dedicated to St. Mark, is in the Early English style, and composed of grey and red brick and stone, and red tiles with ridge crests. It has a double bell turret, with two bells by Mears, under which is a south porch, with stone cross at top. There is a large west traceried window, with smaller ones in the north and south sides. The chancel terminates in an apse with three windows. There is a vestry on the north side. The internal arrangements are as follows:—The roof is an open-timbered one, with the exception of the chancel, which is boarded. The walls are unplastered and bare, and the church is so arranged as to admit of future enlargement. The floor is of Minton's pavement,—of a richer design in the chancel. The seats are of polished pitch pine and deal, and will accommodate 224 persons. The seats for the choir in the chancel have carved poppy-heads. The pulpit is of stone, with alabaster incised in different coloured cements. The baptismal font is of Bath stone, with carved oak cover, surmounted by a wrought-iron cross. The church is heated by Perritt's warm air apparatus. The ironwork to doors, &c., has been made from the design of the architect, by Mr. Leaver, of Maidenhead. The glazing was by Mr. Reynolds, of Thatcham.

Oxford.—The Radcliffe Infirmary Chapel, dedicated to St. Luke, which has been erected at the sole cost of Mr. Thomas Combe, and presented by him to the Radcliffe Infirmary, has been consecrated by the Bishop of Oxford. It is understood that the cost of the chapel was about 2,000*l*.——The old Norman church of Fritwell, having undergone a complete restoration, principally at the expense of the Rev. Samuel Yorke, the vicar, has been re-opened.

Fladbury (*Worcestershire*).—The parish church, after a restoration of the chancel, which has been carried out at the joint expense of the rector, the Rev. J. Haviland, and Mr. J. Cartwright, of Craycombe House, has been re-opened. The walls of the chancel have been cleansed and made good; the roof renewed so far as necessary; an Early English piscina, having two trefoil-headed arches divided by a shaft, and quatrefoil opening above, has been restored; and new sedilia and credence-table provided. The reredos is of alabaster, having in the centre a Greek cross, inlaid with glass mosaic and balls of gilt glass at the extremity of each limb of the cross, as also in the centre. The reredos is the work of Mr. Bolton, of Worcester. Minton's encaustic tiles, in blue, white, green, and brown, have been laid on the chancel floor. The east window, which has been rebuilt, has five lights—being a copy from the old one—and for head tracery a quatrefoil in centre and trefoil on each side. It has been filled with stained glass by Mr. J. Cartwright, of Craycombe House, at a cost of 250*l*., the artist being Mr. Preedy, who was also the architect employed for the chancel and the new schools. The central subject in the east window is the risen Saviour, with the Roman soldiers and the women coming to the sepulchre: this occupies three lights. The other two contain the marriage in Cana and Christ appearing to his disciples at the sea of Galilee after his resurrection. Above is the coming of the Holy Ghost at Pentecost, and in trefoils are angels playing musical instruments. On the south side of the chancel is a small window to the memory of the late Rev. F. Gauntlett. It contains the figures of Christ, as "Behold the Lamb of God," "Come unto me," "The Good Samaritan," and St. John holding the cross, with the label, "Repent ye." A vestry, on the north side of the chancel, has been added. Mr. Espley, of Evesham, was the contractor for the restoration of the roof, and also furnished the stalls in the chancel; and Mr. Hearn, of Worcester, as sub-contractor, executed the masonry. Externally, the soil has been lowered round the east end of the church, and footpaths made, in which work Mr. R. Preedy, the churchwarden, has rendered assistance. The churchyard being too small for the requirements of the parish, and being inconveniently crowded, a large strip of ground on the north side, containing 1,282 square yards, has been added thereto, being the gift of the rector, and a new boundary-wall has been erected.

Rochford (*Worcestershire*).—The parish church of Rochford, near Tenbury, is about to be re-opened, after having undergone a process of restoration, enlargement, and refitting. It was a remarkably small Norman structure, and in order to afford additional accommodation, an extension of the nave westward has been made. The nave roof has been repaired, and the timbers exposed to view internally. The chancel roof has been boarded underneath the timbers. Several new windows have been inserted, and the new east window filled with stained glass, the work of Messrs. Morris, Marshall, & Co. There is also a small Norman window, by Messrs. Heaton, Butler, & Bayne. The fittings internally are generally of deal, stained and varnished. There is a new memorial font, with sculptured panel. The pulpit is enriched by some carving by the hand of the rector. A new open-timbered porch of oak has been erected against the south doorway, and at the west end is a new timber bell-turret for two bells, surmounted by a shingled spirelet. The church now accommodates 156 persons. Mr. Henry Curzon was the architect employed.

Horsepools (*Gloucestershire*). — Horsepools chapel-of-ease has been consecrated. The site is about 50 yards beyond the residence of Mr. S. Bowly, and the ground for the chapel and burial-ground was given by the lord of the manor, Mr. T. M. Croome. The chapel, though in the parish of Painswick, is on the borders of five parishes. Mr. Daukes, of London, formerly of Gloucester, was the architect; and the builders were Messrs. King & Godwin, of Gloucester. The style is Early Decorated, before the development of window tracery. The edifice consists of chancel, nave, and north aisle, and bell-tower and porch on the south side. It is large enough to accommodate 200 persons, and all the seats are free. The architect has reduced the usual height of the roofs and of the spire, in consequence of the exposed position of the building. There is a three-light window at the east end, with three quatrefoils, and a two-light window at the west end, with trefoil. The font, which in design accords with the building, is the gift of the Rev. F. T. J. Bayly. The seats are of stained deal. The rafters supporting the roof are interlaced and stained, the panels being coloured a deep blue. A ribbon of pale colour is carried around the arches. The chancel is fitted with seats for choristers. The pulpit is of stone. The inscriptions in the chancel and porch are in illuminated characters, and have been executed by Mr. Hyett, of Gloucester, under the direction of Mr. J. D. T. Niblett.

Eardisland (*Herefordshire.*). — The parish church has almost been entirely re-built, except the chancel. The architect was Mr. H. Curzon, of London, and the builders were Messrs. Pearson & Son, of Ross. Three iron ties had been placed right across the nave to hold the walls together, for in some parts of both the south and north walls they had bulged out of the perpendicular about 18 inches. The walls have been partially rebuilt, and a new roof put on with a higher pitch, which follows in the line of the existing chancel roof. The same treatment has also been adopted with regard to the porch. The only new window is that on the right of the porch, which, to match the one on its left, is of the wall-flower pattern. The chancel is yet unfinished. The roof has been made secure, but the interior work will come under another contract. The stone used has been obtained from Lucton. The windows have all been re-glazed, and the floor laid with Godwin's encaustic tiles. New arches have been put in at each end of the nave, the Bath stone with which they are faced contrasting with the dark native stone from the neighbouring quarries of Lucton. The tower has been made good up to the floor of the belfry. The original contract for the restoration of the nave, porch, and lower part of the tower was 1,600*l*.; and the contract for the chancel, 150*l*.

Penarth (*South Wales*).—The old church at Penarth has long been felt to be too small and unsightly for the rising town; and now, at the cost of the Baroness Windsor, a new church is about to be erected on the site of the old building; or rather the new one will encircle the old one, which will not be rased until it is absolutely necessary to do so for the purpose of completing the new structure. A design has been furnished by Mr. W. Butterfield, of London. The church will be built in the Gothic style, and will have a tower, nave, aisle, transepts, and chancel. It will accommodate 700 persons. The cost will be about 7,000*l*. The foundation stone has been laid.

Bellingham (*Northumberland*). — The parish church of Bellingham, after being closed for nine months for restorative purposes, has been re-opened. On cleaning the decayed plastering from the walls, there appeared in each corner of the nave a semicircular respond pillar, with cap and base of Early English date, against which the present side walls have been built up; and the chancel arch, and north and east walls of the chancel, are probably of the same date. Tradition says that this church was burnt by the Scots, and the evidence from the building tends to confirm the belief. The wall above the chancel arch appears to have been subjected to the action of fire, and the construction of the present nave and transept, which is, it is believed, unique, indicates that in re-building the church, it has been desired to prevent the recurrence of a similar catastrophe. The chancel and sacrarium have been floored with tiles, the latter being ornamental in character, and provided from a private source. The old nave and transept seats have had to be refixed, but it is hoped that some day funds may be available for suitably reseating the church. The walls have all been repointed outwardly, and provision made for removing the rain-fall from the building. The windows have all been re-glazed. Mr. Johnson, of the firm of Austin & Johnson, was the architect employed to superintend the works, which have been carried out by Messrs. Welton, Mr. Martinson, and others.

Sacriston.—The foundation-stone of the new church of St. Peter, Sacriston, has been laid in that village. The church, which will be of the Pointed Gothic style of architecture, will be erected from designs by Mr. T. C. Ebdy, of Durham, and, when finished, will consist of a nave, a chancel, aisle, porch, and vestry,—the nave and chancel being sufficient for present requirements. The stone of which it will be built will be taken from quarries in the vicinity, and will be given by the Dean and Chapter of Durham. The windows in each side will be stained, and the west end, which faces Sacriston and Edmondsley, will be furnished with a bell-turret, with a Catherine window. Surmounting these windows are others. The total accommodation afforded by the church will be for 464 persons. The builder is Mr. J. Johnston, of Durham. The edifice will cost about 1,700*l*.

DISSENTING CHURCH-BUILDING NEWS.

Bow.—The New Union Church, Grove-road, Bow, the foundation-stone of which was lately laid by Mr. Benjamin Scott, F.R.S. (chamberlain of the City of London), is built upon a plot of land at the junction of the Grove and Esmond Roads, Bow, and consists of nave, aisles, whole length of nave, chancel and chancel-aisles for singers' chamber, organ, and vestry. There is an attached tower, standing out from the church, at the corner of the roads, surmounted by an octagonal slated spire, the whole height being about 110 ft. The total length of the church, internally, will be 84 ft., and the width 56 ft.

6 in. The width of nave is 24 ft., and the chancel 20 ft., and the height from floor to ridge 50 ft. The nave will be separated from the aisles by arcades of four arches each. The chancel will have a similar arcade of two arches on each side. The interior of the church will be faced with white Suffolk bricks, and red and black bricks in bands and devices. The arches will be of ornamental and coloured bricks. The exterior will be of malm bricks, with red and black bands, &c., and Hollington stone dressings. The aisle-walls will be pierced with three-light windows with traceried heads, and the chancel-aisles with two-light windows. The chancel and west windows will be of four lights each, with an extra double and two single light windows to Esmond-road front. The tower, of four stages, contains the principal entrance. The baptistery will be in the chancel. The roofs will be open-timbered and boarded. The seats are to be open, and the whole of the woodwork stained and varnished. The cost of the church, with schools, &c., adjoining, will be upwards of 6,000*l*. The architect is Mr. W. Wigginton, of London, and the builder Mr. T. Ennor, also of London.

Southend.—The chief stone of a new Congregational chapel has been laid at Southend. The new building will be erected on a suitable plot of ground presented for the purpose by the Cliff Town Building Association, and the total cost is estimated at 2,532*l*., the greater part of which has already been raised. Mr. Dixon, of Kentish Town, is the architect; and Mr. Mann, of London, the builder.

Folkestone.—The foundation-stone of a new Wesleyan chapel has been laid here. The site selected is on the brow of the ascent on the turnpike road leading from Dover, at the junction of East-place with Rendezvous-street and Grace-hill. The new building will be in the Early English style, with a spire. The ground-floor will be occupied by school-rooms, and the body of the chapel, measuring about 50 ft. by 90 ft., will be furnished with pews. Galleries will be suspended on three sides, and accommodation will be provided for 900 persons. The walls will be of Kentish ragstone, having the windows, doors, &c. faced with Bath stone: the steeple, also, if erected (a point at present in abeyance), will be entirely of the latter material. The cost of the new edifice itself, independent of the site, will be 3,500*l*.; including the purchase of the land it will amount to 4,000*l*. Mr. J. Gardner is the architect.

Luton.—The foundation stone of a new Congregational church has been laid here. The proposed building will be situated in King-street, and it is to be in the Gothic style, with a spire. When completed, the chapel will accommodate 1,200 persons; and a school-room beneath the building is to be arranged so as to hold 1,200 children. The architect is Mr. John Tarring, of London; and the builders are Messrs. Smart, of Luton. The cost of the church, including the price of ground, is 6,000*l*.

Oundle.—A newly-erected Independent chapel has been formally opened. The chapel is in the Early Decorated style, the walls being of cut stone, with Bath stone facings. The roof is covered with slate, and there are two entrance porches. The main timbers of the roof are visible, and, with the rest of the wood-work, stained and varnished. There is an end gallery facing the pulpit, and two side galleries are contemplated. A school-room and vestry are erected at the back. The area is 35 ft. by 63 ft., and will at present accommodate 500 persons. The entire cost was 1,620*l*. Mr. Poulton, of Reading, was the architect.

Ipswich.—The chief stone of the new Congregational chapel has been laid in Crown-street, High-street. The contract for the building is 2,040*l*. The site cost 750*l*.; but old materials yielded 250*l*.

Cherrytree (*Ecclesall*). — A new Wesleyan Chapel has been commenced at Cherrytree. The site selected is at the junction of Oakdale-road with Brincliffe-road, a short distance beyond Ecclesall Union Workhouse, and in a line with the building which the New Connexion has erected in the same road. Messrs. Wilson & Crosland are the architects, and they have prepared plans for a chapel with schools beneath it. The chapel will be in the Decorated style There will be accommodation for nearly 500 persons, and the schools will form the basement. The cost of the building will be about 1,800*l*.

Liverpool.—The foundation stone of a new Congregational chapel has been laid in Church-street, Waterloo. The architect is Mr. C. O. Ellison, of Liverpool, whose design was selected out of three or four sent in for competition by local architects; and the builder is Mr. J. Westmoreland, of Islington, in this town. The interior dimensions of the chapel will be:—Length, 67 ft.; breadth, 48 ft.; and height, 40 ft. The height from the ground to the top of the spire will be 90 ft.; and to the apex of the roof, 60 ft. Behind the chapel will be vestries and lecture-rooms of considerable size, with entrances from the side street, and communication with the chapel. Provision is also made for tea boilers, heating-apparatus rooms, and other conveniences. The cost of the building will be 4,000*l*. The building will accommodate about 800 people.——The foundation stone of a United Presbyterian church has been laid in Prince's-road. The church, which is to consist of a nave, transepts, and a lofty campanile, is to be built almost entirely of brick, stone being used very sparingly. The walls are to be of red patent brick, enriched by ornamented bands of black brick, and light-coloured stone. The arches of the windows and doors are to be worked in moulded red and black brick, and the jambs are to be finished in square brick. The tracery of the windows, columns, and tympani of the doors is to be of stone. There will be a tower 135 ft. high. Behind the church will be a lecture-hall, to seat 350 persons, vestries, &c. The architects are Messrs. W. & G. Audsley; and the builders are Messrs. Haigh & Co.——The large church which has been erected by the United Presbyterian body, at the junction of the Breck-road and Queen's-road, Everton, has been formally opened for public worship. The edifice is a prominent feature amidst the numerous and still increasing buildings around it. The style is Perpendicular. The building is cruciform, having a nave about 74 ft. by 66 ft., with transept 15 ft. by 19 ft. The edifice is nearly square, the main frontages being in Breck-road and Queen's-road. The tower, at the corner of Breck and Queen's roads, is octagonal, with a square base of 21 ft. in extent, and rises to an elevation of 70 ft. It is surmounted by crocketed finials at each octagonal angle, and at the east, west, and north sides of the tower it is intended to place a clock. From the summit of the tower a spire ascends to an additional height of 63 ft.; the entire elevation from the tower basement to the pinnacle of the spire being 133 ft. The spire tapers rapidly. It was the architect's desire to have carried it to an additional height of from 25 ft. to 30 ft. The area of the tower is large enough for a complete peal of bells. The interior of the edifice is plain. The windows on the north, south, and west sides of the edifice are uniform. They are of the large triplet character, all being filled in with stained glass, as well as four smaller windows on the east side. Including the gallery at the west side, the edifice will accommodate about 850 persons. All the seats are open benches, in stained oak, being, in this respect, uniform with the pulpit, or rather platform, at the east side of the interior, which is 4½ yards in length by 2½ yards in depth. The architect of the church was Mr. W. H. Weightman. Mr. Hugh Yates, of Everton, was the contractor for the general work; Messrs. Edmundson, of Manchester, supplied the stained glass windows; Mr. C. W. S. Waters, the gas-fittings; Mr. R. Paterson and Messrs. Robertson & Mason, the upholstery. There is a bell in the turret, the gift of Mr. H. Wilson; and a clock in the interior, given by Mr. J. Millar. The estimated cost of the building is about 5,000*l*.——The foundation-stone of a new Welsh Calvinistic Chapel, intended to supersede the present one in Bedford-street, has been laid in Prince's-road, near Prince's Park. Mr. David Roberts, who laid the stone, presented 1,000*l*., while others have given in a like liberal spirit. Of the 15,000*l*. which it is calculated will be required to carry out the plans of the architects in their integrity, about 8,000*l*. have already been subscribed.

Lock Bank (*Derbyshire*). — The foundation stone of a new Congregational chapel has been laid here. The new building is estimated to cost, exclusive of a proposed tower, 2,100*l*., towards which about half the money has been paid or promised. The intended edifice is from a design prepared by Mr. Hull, of Northampton, architect; and the contractor is Mr. Francis, of Cromford, Mr. Wildgoose taking the stonework under him. The chapel will accommodate 440 persons on the ground floor, and 100 in the gallery, with provision for additional galleries when required. The site has been contributed by Mr. Stevens, one of the deacons.

Books Received.

Transactions of the Royal Institute of Scotland.

THE work just now issued under this head for the session 1863-4, is a thin folio of "Illustrations of Scottish Buildings." The buildings are Elgin Cathedral and Roslin Chapel. The first is set forth as measured and drawn by John Ogilvie, revised and drawn in lithography by E. F. C. Clarke; the second as drawn in lithography by E. F. C. Clarke. The work will, doubtless, be acceptable to the members; and if it had been issued by the gentlemen who made the drawings, would have met with no depreciatory comment on our part. Whether or not, however, it is such an illustration of Scottish buildings as the architects of Scotland as a body should be content to send forth in their names, is a question to which we do not feel ourselves in a position to reply in the affirmative.

Miscellanea.

INSTITUTE OF PAINTERS IN WATER COLOURS.—The Prince of Wales and the Princesses Helena and Louise visited the Institute of Painters in Water Colours this (Thursday) morning.

THE NATIONAL GALLERY ENLARGEMENT.—The House of Commons have voted 20,000*l*. out of a maximum sum of 100,000*l*. for the purchase of the site for the enlargement of the Gallery.

ROYAL ITALIAN OPERA.—*Linda di Chamouni*, revived for Mdlle. A. Patti, was received with great favour by a good house on Monday evening. Both as actress and singer Patti was admirable. Mdlle. Scalese made a good impression as the faithful Savoyard boy. *Fra Diavolo* is underlined for Saturday next.

THE HANDEL FESTIVAL.—We would briefly say, out of our desire to assist in rendering the approaching Festival at the Crystal Palace as great a success for the Company as we feel persuaded the Company have ensured it being for the music-loving public, that on (this) Friday, the 23rd, the full Rehearsal will take place, commencing at one o'clock, and will include the most important parts of the works that are to be given completely during the following week, commencing on Monday with *Messiah*.

THE REMOVAL OF TEMPLE-BAR. — A correspondent, "G. E.," writes,—Having read that Temple-bar will be taken down, for the purpose of widening the approaches to the contemplated improvements in the Strand; and thinking it a pity that the old landmark should be either demolished or lost sight of, I take the liberty of suggesting the propriety of placing it in one of the parks. Perhaps the entrance to the ornamental inclosure opposite the Horse Guards would be as good a place as any, as it would harmonize very well with the building in front of it, and show with good effect from the entrance in Parliament-street.

WATER SUPPLY.—At Bolton there is already a scarcity of water. The *Bolton Chronicle* draws attention to the urgent necessity of economising the use of it as far as possible, alike for domestic and manufacturing purposes. At the council meeting it was stated that at present there are 58,000,000 gallons less in storage than at this time last year. The quantity of water in the lodges is 139,000,000 gallons, or only two months' supply; and, with dry weather such as the present, the supply must further diminish.——The engineers of the Sheffield Water Company are resuming work at the Agden embankment, which was partially completed before the Bradfield inundation. Immediately after the bursting of the Dale Dyke, the directors of the company stopped the works at Agden. The directors obtained the advice and services of Mr. Hawksley, engineer, instead of Mr. J. T. Leather. Mr. Hawksley immediately requested that Mr. J. Gunson would continue to act as the resident engineer. It is expected that the Agden bank will be completed in about two years. The Strines dam will shortly be commenced. It is said that the embankment at Bradfield will be repaired so as to admit of the storage of a comparatively small quantity of water for the supply of the mills in the valley below; and that a large reservoir will be constructed at a point higher up the stream.

TELEGRAPHIC.—A new submarine cable has just been laid between Sicily and Algeria. Italy will thus be directly connected with Africa by two telegraphic lines, establishing immediate communication with Tunis and Algeria. These lines pass over the island of Favognana.

FATAL COLLIERY EXPLOSION.—Twenty-seven men have been killed by another of these frequent explosions. The occurrence took place at Bedwellty pit, Tredegar. There were two hundred men in the pit at the time, who escaped from the after-damp by retreating to the bottom of the pit.

THE DUBLIN EXHIBITION BUILDING.—We understand that some discussion has prevailed in Dublin with reference to the use to which the Exhibition building should be put after the close of the Exhibition. The suggestion which has won most favour is, that the greater portion of the building should be devoted to the purposes of a winter garden, while that portion now used as the machinery department should be converted into a gymnasium. The building belongs to a Company.

THE LIVERPOOL CONSULTING SURVEYORSHIP.—At the last meeting of the town council, a letter was read from Mr. Weightman, intimating his intention to retire from the office of consulting surveyor on the 1st of October next, and expressing grateful feelings towards the members of the council for the consideration and kindness he had ever received. A general desire was expressed that, if it was consistent with Mr. Weightman's health and future arrangements, they should still retain some portion of his services. The letter was referred to the finance committee.

THE NEW COURTS OF JUSTICE.—A sum of 700,000*l.* has been voted by the Commons for the purchase of the site. For the year ending 31st March, 1866, the sum of 200,000*l.* will be required on this account. The House of Lords have agreed not to insist on their amendments on the Building Bill. They have also agreed to the alteration, by the Commons, of Lord Redesdale's amendment of the Site Bill, that the erection should not be begun until the site was obtained and the plan approved of by Parliament. The delays have caused a proprietor of seventeen of the freehold houses to complain, by petition to Parliament, that she has lost all the tenants and rents of these properties for the last four years.

NORTHAMPTONSHIRE ARCHITECTURAL SOCIETY. The annual spring meeting of this society was held at Brackley. The meeting was not so large as it generally has been for the last few years. In the course of the excursion several churches, which well repaid the visit, were examined and described. Sir Henry Dryden, bart., paid several preliminary visits to them, and made himself thoroughly conversant with all their details and peculiarities. All the churches were described by Sir Henry. The meeting opened with a museum, which was held in the town-hall. The great majority of the contents of the museum were contributed by Sir Henry and his friends, and by Mr. Samuel Sharp, of Dallington. In course of the meeting, papers were read, by Mr. Sharp on Forgeries (of flints, money, &c.); and A Plea for Drapery (in churches), by the Rev. G. A. Poole.

SCIENCE AND ART DEPARTMENT.—The Committee of Council on Education have just published their twelfth report of the Science and Art Department. Under the present system of aid to science schools and classes inaugurated by the minute of June, 1859, there have been six annual examinations for certificates as science teachers, and four general examinations of students. The following statistics show the results:—

	1859.	1860.	1861.	1862.	1863.	1864.
Teachers—Candidates	67	89	103	125	109	115
Obtained certificates	43	75	97	112	95	96

Of students there are now 91 classes, containing 4,666 students. The number examined last year was 2,070, and the number of prizes awarded, 1,318. The largest number of candidates are in chemistry; 851 having been examined in inorganic, and 142 in organic chemistry. The subjects embraced are very numerous—geometry, mechanical drawing, acoustics, electricity, geology, mineralogy, animal physiology, botany, general navigation, naval architecture, &c. Altogether there are now 114 classes and 5,054 students in them.

ACCIDENTS.—At the Calls, Leeds, a portion of the western gable fell outwards at the top of the seven-story warehouse of Mr. J. T. Pearson, agricultural chemist and corn merchant. The occurrence arose from a fracture of the roof-beam, caused by a defect in the timber. There were from 8,000 to 10,000 quarters of wheat stored in the warehouse, but in the top story only 520 quarters of grain were deposited, while on each of the other floors there were 1,500 quarters.

NEW BATTERSEA BRIDGE.—The Albert Bridge Company having obtained power to construct a bridge over the Thames to connect Chelsea with Battersea, the several points being Cheyne-walk on one side and Prince Albert-road on the other, are inviting applications for 9,000 shares of 10*l.* each, representing a capital of 90,000*l.* for that purpose. They have power also to borrow 30,000*l.* The bridge, of which we have given illustrations, is to be partly on the suspension principle, and a responsible contractor has undertaken to complete it ready for traffic in eighteen months for 82,000*l.*, taking part payment in paid-up shares. Arrangements have also been made for the purchase of Battersea Bridge for a rent-charge of 3,000*l.* per annum, the tolls on which, in 1862, were 6,153*l.* A clear income of 9 per cent. is anticipated.

THE ELM-TREE.

The Elm-tree grew
In the distance blue,
For the hammer, and nail, and plane;
For the dust of those
Who need repose,
Whom the arrow of death hath slain.

The Bell was cast
To chime the last
Frail homage that can be shown
To the friends we grieve,
Whom Heav'n receive,
And the angels make their own.

For God's deep care
Is every where,
And His love is ever thorough,
When the Elm-tree grows
In the wild hedge-rows
To be sawn for *us* to-morrow.

A. H.

PROJECTED RAILWAY THROUGH THE THAMES TUNNEL.—A prospectus has been issued of a new metropolitan railway, to complete the system recommended by the Parliamentary Committee of 1864. It is to be called the East London Railway, with a capital of 1,400,000*l.*, in shares of 100*l.* Its entire length will be about 8 miles, and it will run from junctions with the North Kent, Brighton, and South-Western lines in the New-cross district, south of London, to the Great Eastern Railway at Fenchurch-street (passing through the Thames Tunnel), and thence to a station at Liverpool-street, near the Bank, where it will connect with the Metropolitan district line. The work is undertaken by Messrs. Brassey, Lucas, & Wythes, and the cost per mile, it is stated, will be less than that of any other metropolitan railway. A return of 14 per cent. is anticipated.

STONEHENGE.—At a recent meeting of the Ethnological Society, the paper read was "On Stonehenge," by Professor Nielson. His views were, that Stonehenge was a temple of early fire-worshippers, and of pre-Druidical origin, and belonging to the "Bronze Period" of the northern archæologists. The remains of Stonehenge, he remarked, are placed, not on the summit, but on the declivity of a hill surrounded by numerous barrows, from which bronze articles have been exhumed with others of flint, but never any of iron. He considers that fire-worshippers preceded Druids in Britain and Gaul, and gives what he considers as numerous proofs of the building of such stone open temples by colonies of Phœnicians. Circles of large stones exactly identical in description with those called Celtic or Druidical, he continued, are found in countries where neither Celts nor Druids ever existed; but how does he know that? and who knows at what time the ancient religion of this country may be truly said to have been pre-Druidical or pre-Celtic in its principles? From various considerations the author of the paper thinks there may be sufficient reason to regard the remains of Stonehenge as Phœnician, and connected with the rites of Baal, like their congeners at Tyre and in the valley of Berthel.

POWDER.—The *Western Morning News* states that Mr. Gale, electrician, of Plymouth, has discovered a process by which powder can be rendered non-explosive, and its combustible properties restored when required. The cost is very small, and has the advantage of being readily applied. In five minutes a barrel of powder can be made non-explosive, and in another five minutes it can be restored to its original condition. If a shell burst in a store filled with the prepared powder, it would not fire it!

IMPROVED TRAVELLING CRANE.—Mr. T. B. Burnett, of Mount Vernon, New York, has invented an improved travelling crane. The gearing by which the weights are raised is similar to that on ordinary cranes, and the hoisting chain is led up over a boom, which is jointed at the bottom, so that it can be raised or lowered. The rigging is composed of heavy iron bars, and there is a counterbalance box behind the crane. When the crane has been loaded, and is ready to be transferred from the point where it is at work, the labourers apply themselves to handles which act on gearing below the platform on the front axle. By means of a small pinion meshing into this gear, they are enabled to remove any weight that can be raised by the crane to any point on the truck.

AMALGAMATED SOCIETY OF ENGINEERS.—The fourteenth annual report of this society, for the year ending December, 1864, has just appeared. It is a voluminous compilation. The expenditure during the year was from all sources 51,518*l.* 12*s.* 6*d.*; and, at the close of 1864, the accumulated fund amounted to 86,947*l.* 15*s.* In 1863 the amount paid to members out of work was 32,653*l.* 6*s.* 10½*d.*; but in 1864 the sum under the same head was only 16,425*l.* 9*s.* 6½*d.*, which, added to 13,612*l.* 4*s.* 7½*d.* sick benefit, 3,902*l.* 5*s.* 7*d.* superannuations, 3,924*l.* 0*s.* 11½*d.* funerals, and 1,100*l.* benefit in cases of accident, shows members to have received under the various heads 38,964*l.* 0*s.* 8½*d.* during twelve months. The accumulated fund of the society now averages 3*l.* 0*s.* 6*d.* per member.

THE EXLORATIONS AT KEISS.—A notion seems to be entertained that the human beings of what is called the stone period, were specimens of Nature's mere apprentice hand, and that their organization had not then reached the comparatively high order of development since attained. A discovery recently made at Keiss, in the north of Scotland, will help to explode this opinion; and, strange to say, the evidence is that of a woman, heretofore so rare of the stone period, that it is a wonder sticklers for matter-of-fact evidence have not doubted whether women especially then existed! The cranium of this witness "shows that in the amount of space for the brain, it not only considerably exceeds in its capacity that of the skulls of women of modern savage races, but is on a par with, or even somewhat in excess of, the average cranial capacity of the women of our own island at the present day." The ridges on the bones for the attachment of muscles "possess no great prominence: hence it may be concluded that the woman was not required to lead a life compelling any great amount of muscular exertion." The thigh bones were elegantly formed. The stature was probably not more than 5 ft. 4 in.

THE FOUNDATION OF THE MANSION HOUSE, LONDON.—At the last meeting of the Court of Common Council, a report was brought up by Mr. H. Haines, relative to the state of the foundations of the Mansion House, and for authority to expend 500*l.* in part restoration of the same. The ground having been opened in George-street to examine the state of a sewer that ran from east and west of the Mansion House, they endeavoured to ascertain, if possible, the cause of the settlement that had taken place at that part, and they found it was built on a wooden foundation which showed very strong symptoms of decay, and which was, in several places where the ground had been opened, completely rotten. The city architect had been communicated with, and had made an examination, and was of opinion that steps should be taken at once to make secure the foundation in those places, which he estimated at a cost of about 500*l.* Mr. Haines explained to the Court that it might not be the only sum which would be wanted, as perhaps, when a further examination took place, it might be found that the whole of the foundation was in the same state, and it would in that case become necessary to pin the walls up all round. The report was agreed to.

GAS IN THE CITY.—The several petitions against the present quality and price of gas having been referred to a special committee, the committee, in reply, recommend that an effort should be made to obtain some alteration of the Gas Act of 1860; but, as this solution of the matter seems unsatisfactory, a motion has been put before the Court of Common Council to return the report to the committee, with instructions to obtain power for the Corporation either to contract for the supply of gas or to manufacture the gas, as is done by the corporations of Manchester and other towns.

GREAT RISE IN THE VALUE OF PROPERTY IN LONDON-ROAD, LIVERPOOL.—Two blocks of buildings in the locality have been sold at the rooms of the Law Association in Cook-street. The premises are on the north side of London-road, between Norton-street and Stafford-street, and a little below the monument. They consist of eight tenements, six being shops, and two public-houses. The property is leasehold under the Corporation of Liverpool, for an unexpired term of fifty-four years, and was sold under an order from the Court of Chancery. The property has been valued by Messrs. Culshaw & Griffiths at 8,540*l.*, the rentals averaging about 80*l.* per annum for each tenement. The total amount for which the property was sold was 16,430*l.*

THE MORNING DRIVES OF CHILDREN.—Often when the sun has been shining brightly on the hills of Highgate and Hampstead, and in other parts of the metropolitan suburbs, and the air there has been dry and healthy, in some districts the mists have been lying thick, and the humid atmosphere has rendered the vicinity of the parks, and several of the valleys, most unhealthy for the airing of young children or persons of delicate and sickly constitution. Nevertheless, we have hundreds of times noticed in the fashionable drives and walks about the Serpentine, St. James's Park, &c., young children of the higher classes, who should be in the care of those who are better advised, exposed to a most damp and unwholesome atmosphere.

THE EXCAVATIONS AT KEYNSHAM ABBEY.—A correspondent of a Bristol paper writes as follows in reference to the excavations at Keynsham Abbey:—"It is with regret that upon my visit this day to the above interesting remains of the Middle Ages I found that a large portion of the earliest tile pavement had been taken away, evidently by visitors. All antiquarians must regret this act, as the portion removed was, I believe, the only Norman tiles remaining on the site. I trust all persons will refrain from removing even the smallest portion of the relics, as the proprietor of the land, who is clearing the soil and rubbish, is endeavouring to retain as much of the remains as possible *in situ*; and I feel sure he would much regret being compelled to close the site to the public, or to carry out his determination to prosecute any person that may be discovered taking away any portion of the antiquities."

PNEUMATIC RAILWAY UNDER THE THAMES.—The recent experiment at the Crystal Palace has led to the idea of carrying out a short line to connect the Waterloo Station of the London and South-Western Railway with Whitehall, passing in a troughed iron bridge, or surface tunnel, under the Thames. Three piers will be built below the bed of the river, by means of iron caissons. When these piers have been brought up to within a few feet of the bed of the river, the upper portions of the caissons will be taken off, and the bed of the river between the line of piers dredged down to the level of the upper course of the masonry of the piers, and in the trough thus formed the iron tube will be made. The tube will be lowered in four separate sections. When down, these will be kept securely in their place by cramps, and will be covered with a thick bed of concrete. The internal diameter of the tube will be 12 ft. The portion of the line between Whitehall and up to the river front of the Thames Embankment will be built in brickwork; and on the Surrey side the line will also be continued in brickwork under College-street and Vine-street, close to the Waterloo Station of the South-Western Railway, with which it will communicate by a flight of steps from the York-road side of the station. The steepest gradient throughout will not be more than 1 in 30, which is nearly one-half more favourable than the ascent of Holborn-hill, or that of the experimental line at the Crystal Palace.

THORNLEY CHURCH. — The parishioners of Thornley have resolved to place a stained glass window in Thornley Church, in memory of the late H. J. Spearman, who represented the city of Durham from 1847 until the general election in 1852.

STAMFORD.—The (R.C.) church of "Our Ladye and St. Augustine," although used for worship for some months past, was not solemnly opened until lately. The building, which is in the geometrical style, occupies a site in Broad-street. The nave has a wide span, and terminates in an apsidal recess, within which stands the altar. An apse to the right of the altar is appropriated as the Lady Chapel, and in this has just been placed a statue of the Madonna. On the left of the nave there is an aisle, the altar for which has not yet been obtained. The church will accommodate about 400 people. A residence for the priest adjoins the church. The architect was Mr. Goldie, of London.

THE COAL TAR COLOURS.—At the Royal Institution, lately, Mr. F. Field delivered a lecture on "Magenta and its derivative Colours obtained from Coal Tar," in course of which he stated that one of the recent discoveries of these colours was that of Hoffin's violet, a mass of which was placed on the lecture-table; and this material, though derived from a mere refuse product, is five or six times the value of its weight in silver, the mass on the table being estimated to be worth 700*l.* A great many experiments were exhibited, showing the production of various colours from the same agent, in which many substances were dyed. Mr. Field mentioned as an instance of the great intensity of the colour of magenta, that when the *Great Eastern* was disabled and lying in the trough of the sea, considerable alarm was entertained on account of the blood-colour of the water extending for a great distance round the ship. It was afterwards discovered that this effect was produced by the breaking of a vessel containing a quantity of concentrated magenta. Much as has been hitherto discovered respecting the nature of coal-tar dyes, a good deal yet remains to be found out, among which may be included the discovery of the means of imparting some of the dyes to woollen material as easily as to silk.

DRY SOIL CLOSETS.—A Galashiels correspondent, Mr. James Kerr, says he has since last year been using with satisfaction a simple apparatus, by which the deposits are at once deodorized by coal ashes or earth, and thus thrown out into a shoot or iron bin for removal by the dustman's cart or for garden use. The mechanical action of this "earth closet," he says, is very simple, the whole process being effected by opening and closing the lid, to which is affixed the lever cranks. He wishes to call the attention of landed proprietors, architects, builders, and others to the use of such earth closets in many situations where it would be preferable to a water-closet, viz., where there is deficient water supply or want of proper drainage, and the immediate deodorizing of offensive matter ought to be effected at once, instead of running it into festering cesspools or ill-constructed drains. By the admixture of ashes or earth with the night soil, also, the ammonia and other fertilizing properties are at once absorbed and retained for the field or garden. Mr. Kerr is not the originator of dry soil closets, but his plan may be an improvement on others. The Royal Scottish Society of Arts are said to have recommended it to the consideration of their prize committee for the simplicity of its mechanical action.

TENDERS

For building ten almshouses, with reading-room and small museum, at Ramsgate, for Sir Moses Montefiore, bart. Mr. H. D. Davis, architect:—

Newman & Mann	£6,440 0 0
Macers	6,393 0 0
Myers & Sons	6,261 0 0
Stiff & Richardson	5,869 0 0
Newby	5,520 0 0
Sawyer	5,510 0 0
Matthews	5,174 15 0
Elgar (accepted)	5,100 0 0

For forming an extension of the sea-wall and terrace, at Aberystwith. Mr. H. D. Davis, surveyor to the corporation:—

Moore	£2,987 0 0
Jones (accepted)	1,998 0 0

For alterations and additions to 7, Castle-street, City. Mr. Herbert Ford, architect:—

Hostell	£920 0 0
Rawlins	738 0 0
Palmer & Son	537 0 0

For painting, &c., at Christ Church, Rotherhithe:—

West & Morse	£263 10 0
Ward & Nicholls	231 15 0
Kent	199 10 0
Smith	196 13 4
Batt & Co.	192 5 0
Day	192 0 0
Dunn	181 0 0
Poole	180 0 0
Wilkinson & Co.	178 19 0
Boyce	175 5 0
Nightingale	161 0 0
Minty	160 0 0
Richards	155 0 0
Norris & Son	155 0 0
Johnson	150 0 0
Thorpe	136 0 0
Dowsing (accepted)	122 5 0
Mahoney	116 0 0

For pianoforte warehouse, for the London Pianoforte Company (Limited). Mr. Septimus Hoskins, architect:—

Manley & Rogers	£2,467 0 0
Mann	2,156 0 0
Lamble	2,139 0 0
Walton	2,049 0 0

For finishing a pair of villas, at Wood-green, for Mr. Vardey. Mr. T. W. Reed, architect:—

Lamble	£593 0 0
Sale	589 0 0
Jones	549 0 0
Green	525 0 0

For dwelling-house, in Bath-street, Sheffield, for Mr. J. Wragg. Messrs. Flockton & Abbott, architects:—

Reynolds	£660 0 0
Robertson	655 0 0
Harrison (accepted)	600 0 0

For alterations and additions, at the Cutlers' Hall, Sheffield. Messrs. Flockton & Abbott, architects:—

Neill	£6,546 0 0
Messrs. Craven	6,535 0 0
Bradbury	5,715 0 0
Wade (accepted)	5,715 0 0

For re-building and restoring Saville House, Leicester-square. Messrs. Nelson & Innes, architects:—

Mansfield	£13,110 0 0
Myers	12,916 0 0
Macey	11,485 0 0
Carter	11,467 0 0
Jackson	11,400 0 0
Simpson	11,240 0 0
Howard	11,111 0 0
Maley	10,555 0 0
Barlow & Rigby	9,930 0 0

For the erection of two houses, in Drummond-road, Bermondsey, for Mr. Daniel Martin:—

West & Morse (accepted)	£538 0 0
Stokesbury*	525 0 0
Clark*	511 10 0
King*	510 0 0

* Too late.

For sundry alterations and repairs to the Ancient Briton, Long-lane, Bermondsey, for Mr. Chapman:—

Carter	£113 0 0
Roffey	112 10 0
Kepps	109 0 0
West & Morse (accepted)	108 10 0

For new sewers in Rouel-road, for the Bermondsey Vestry. Mr. Elkington, surveyor:—

Carter	£720 0 0
Kent	657 0 0
Parker	595 0 0

For alterations and additions to warehouse, No. 7, Castle-street, City, E.C., for Messrs. Knight, Wells, & Braham. Mr. Herbert Ford, architect:—

Palmer & Son (accepted)	£537 0 0

For Congregational Chapel, Sevenoaks. Mr. Tarring, architect:—

	General Estimate.	Spire.	Total.
Newman & Mann	£2,961	315	3,276
D. & J. Grover	2,944	211	3,156
Kilby	2,820	170	2,990
Simpson	2,765	200	2,965
Hoadley	2,713	220	2,933
Potter	2,280	160	2,440

For additions and alterations, at the Jews' Orphan Asylum, Goodman's-fields. Mr. N. S. Joseph, architect:—

Killby	£2,593 0 0
King & Sons	2,590 0 0
Conder	2,521 0 0
Cohen (accepted)	1,900 0 0

For alterations to Congregation chapel, Hanwell. Mr. J. Scott, architect:—

Tyrell	£240 0 0
Hanson	237 0 0
Gibson	222 0 0
Battey	221 0 0

For alterations and additions to Mr. W. Tucker's premises, at Brackley, Northamptonshire. Mr. J. Usher, architect:—

Munday	£610 0 0
Robinson	520 0 0
Hackett (accepted)	488 0 0

For rebuilding Rosebank, Fulham, for Col. McMurdo, C.B., &c. &c. Mr. John T. Wimperis, architect. Quantities supplied:—

Foxley	£3,538 0 0
Abbott & Sons	3,445 0 0
Nicholson	3,335 0 0
Carter & Sons	3,280 0 0
Fish	3,220 0 0
Hale	2,905 0 0
Moultrie	2,892 0 0
Hill & Sons	2,774 0 0